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Standardizing and Automating the Southeast Alaska Pink Salmon Escapement Index

by

Steven C. Heinl

and

Andrew W. Piston

April 2009

Alaska Department of Fish and Game **Division of Commercial Fisheries**

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Weights and measures (metric)

centimeter	cm
deciliter	dL
gram	g
hectare	ha
kilogram	kg
kilometer	km
liter	L
meter	m
milliliter	mL
millimeter	mm

Weights and measures (English)

cubic feet per second	ft^3/s
foot	ft
gallon	gal
inch	in
mile	mi
nautical mile	nmi
ounce	oz
pound	lb
quart	qt
yard	yd

Time and temperature

day	d
degrees Celsius	°C
degrees Fahrenheit	°F
degrees kelvin	K
hour	h
minute	min
second	s

Physics and chemistry

all atomic symbols	
alternating current	AC
ampere	A
calorie	cal
direct current	DC
hertz	Hz
horsepower	hp
hydrogen ion activity (negative log of)	pH
parts per million	ppm
parts per thousand	ppt, ‰
volts	V
watts	W

General

Alaska Administrative Code	AAC
all commonly accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.
all commonly accepted professional titles	e.g., Dr., Ph.D., R.N., etc.
at	@
compass directions:	
east	E
north	N
south	S
west	W
copyright	©
corporate suffixes:	
Company	Co.
Corporation	Corp.
Incorporated	Inc.
Limited	Ltd.
District of Columbia	D.C.
et alii (and others)	et al.
et cetera (and so forth)	etc.
exempli gratia (for example)	e.g.
Federal Information Code	FIC
id est (that is)	i.e.
latitude or longitude	lat. or long.
monetary symbols (U.S.)	$, ¢
months (tables and figures): first three letters	Jan,...,Dec
registered trademark	®
trademark	™
United States (adjective)	U.S.
United States of America (noun)	USA
U.S.C.	United States Code
U.S. state	use two-letter abbreviations (e.g., AK, WA)

Measures (fisheries)

fork length	FL
mideye-to-fork	MEF
mideye-to-tail-fork	METF
standard length	SL
total length	TL

Mathematics, statistics

all standard mathematical signs, symbols and abbreviations	
alternate hypothesis	H_A
base of natural logarithm	*e*
catch per unit effort	CPUE
coefficient of variation	CV
common test statistics	(F, t, χ^2, etc.)
confidence interval	CI
correlation coefficient (multiple)	R
correlation coefficient (simple)	r
covariance	cov
degree (angular)	°
degrees of freedom	df
expected value	*E*
greater than	>
greater than or equal to	≥
harvest per unit effort	HPUE
less than	<
less than or equal to	≤
logarithm (natural)	ln
logarithm (base 10)	log
logarithm (specify base)	$\log_2$, etc.
minute (angular)	'
not significant	NS
null hypothesis	H_O
percent	%
probability	P
probability of a type I error (rejection of the null hypothesis when true)	α
probability of a type II error (acceptance of the null hypothesis when false)	β
second (angular)	"
standard deviation	SD
standard error	SE
variance	
population	Var
sample	var

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By
Steven C. Heinl and Andrew W. Piston

Alaska Department of Fish and Game, Division of Commercial Fisheries, Ketchikan

Alaska Department of Fish and Game
Division of Commercial Fisheries, Publications Section
802 3rd, Douglas, Alaska, 99824-0020

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Steven C. Heinl and Andrew W. Piston,
Alaska Department of Fish and Game, Division of Commercial Fisheries,
2030 Sea Level Drive #205, Ketchikan, AK 99901, USA

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ABSTRACT

The Alaska Department of Fish and Game (ADF&G) has maintained an annual index of the pink salmon escapement in Southeast Alaska, generated from aerial survey observations. Prior to 2008, this escapement index was available only through interim reports or directly from the regional pink salmon biologist. The index was calculated manually in spreadsheets on a personal computer, possibly leading to the introduction of unseen errors, and the methods used to construct the historical index were never formally documented. Thus, it would not be possible to duplicate the current pink salmon escapement index. The department launched a project to automate the calculation of the pink salmon index through the ADF&G Integrated Fisheries Database and make it widely available to ADF&G staff. This process required us to designate pink salmon index streams, pink salmon index observers, and annual peak aerial survey counts for each stream within the database; provide a means to impute missing values for index streams that lacked a peak survey count in a given year; and provide an interface that would report standard pink salmon escapement indices for Southeast Alaska from 1960 to the most current year on named spatial scales (sub-regions, management areas, districts, stock groups). The process of automating the calculation of the index allowed us to conduct a critical review of how the index was constructed and make changes as necessary. The largest change that we made was the complete removal of observer "bias" calibrations which were intended to convert observer counting rates to the same level, but instead appeared to induce error into the index. Other changes included adding and deleting index streams, and adding index observers to make better use of survey data, particularly from the 1960s.

Key words: aerial survey, escapement index, observer calibration, *Oncorhynchus gorbuscha*, pink salmon, Southeast Alaska, Southeast Alaska Integrated Fisheries Database.

INTRODUCTION

Wild pink salmon (*Oncorhynchus gorbuscha*) spawn in approximately 2,500 short, coastal streams in the Southeast Alaska (Zadina et al. 2004), and support a large and valuable commercial fishing industry (Clark et al. 2006). Pink salmon accounted for 71% of all the salmon harvested (by numbers of fish) in Southeast Alaska over the 10-year period, 1998–2007. An average of 47 million fish per year were taken in the commercial fishery in Southeast Alaska over that same period, including an all-time high catch of 78 million fish in 1999. The exvessel value of the commercial pink salmon harvest averaged $20 million a year, and ranged between $8 million and $32 million, making the pink salmon the most valuable species after the chum salmon (*O. keta*) in Southeast Alaska fisheries.

The Alaska Department of Fish and Game (ADF&G) manages Southeast Alaska pink salmon stocks through extensive inseason monitoring of harvests, fishing effort, and developing escapements (Van Alen 2000, Zadina et al. 2004). Because pink salmon production is broadly dispersed in Southeast Alaska, the inseason assessment of escapements has been based on aerial observation. Prior to making decisions about fishing effort, experienced fishery managers fly over miles and miles of pink salmon spawning habitat and assess whether adequate numbers of salmon are moving into spawning habitat, and whether the timing of the escapement is consistent with previous patterns. Surveys are normally conducted in a Piper Super Cub airplane flown at an altitude of 150 to 200 m, and a speed of approximately 90 km/hr (William Bergmann, Commercial Fish Management Biologist, ADF&G, Petersburg; personal communication). An average survey may last less than a few minutes, which gives the surveyor time to get a quick impression of the numbers of fish in the creek. In creeks with high abundance, this requires making rapid judgments of fish numbers in pools that may contain many thousands of fish. Although the managers fly these surveys to assess inseason abundance to base management decisions, a numerical summary of their visual impressions about salmon abundance is retained as one of the most important indicators of salmon abundance and management success.

The department has maintained an annual index of the pink salmon escapement in Southeast Alaska, generated from these aerial survey observations. The methods used to calculate the index have changed at different times as knowledge of the region's pink salmon grew in response to research programs designed to improve pink salmon management (e.g., Durley and Seibel 1972, Jones and Dangel 1983, Hofmeister et al. 1993). In instances where major changes were implemented, the entire index was recalculated for all years to ensure the index was consistent. The most recent method of generating an annual index of the pink salmon escapement from aerial surveys was described in general terms by Hofmeister (1998) and Van Alen (2000), and recently summarized by Zadina et al. (2004) and updated by Heinl and Geiger (2005).

It is important to understand that the southeast Alaska pink salmon index does not provide an estimate of the total escapement or true population size (Hofmeister 1990, Van Alen 2000, Zadina et al. 2004), and its relationship with the total pink salmon escapement in southeast Alaska is far from certain. An *escapement estimate* is a statistically reliable measure of escapement magnitude (the total number of fish in the escapement). An escapement estimate is approximately in the same units as the estimates of harvest, and harvest estimates and escapement estimates can logically be added together to produce an estimate of total run size. Alternatively, the *escapement index* is the peak count of spawning fish in the stream over several surveys conducted during the time when spawning fish are present in the stream. The peak count is a relative measure of escapement, useful for tracking trends in escapement and for year-to-year comparisons.

Although it is likely that a large portion of the region's pink salmon production is represented in the various indices ADF&G has used in the past, the current index simply does not include all of the 2,500+ pink salmon producing streams in the region. Because past indices have been constructed from peak or maximum survey counts, many or most of the counts do not include fish that were not present at the time of the survey (e.g., fish that had spawned and died or fish that had not yet arrived on the spawning grounds). In addition, aerial surveyors tend to underestimate the true abundance of fish in a stream (Bevan 1961, Cousens et al. 1982, Symons and Waldichuk 1984, Dangel and Jones 1988, Bue et al. 1998, Jones et al. 1998). In the past, ADF&G has multiplied the escapement index by a constant (2.5) to approximate the total escapement (e.g., Hofmeister and Blick 1991); however, the tendency to underestimate the numbers of fish in a stream increases as the density of fish increases and the relationship between the observer bias (Jones et al. 1998) and the number of fish in a stream is probably not a linear relationship. In reality, there is no simple way to convert the current index series to an estimate of total escapement in Southeast Alaska.

We term the index published by Zadina et al. (2004) the "2003 index" to give the series based on the methods described by Zadina et al. a specific name. The 2003 index was based on a standardized set of peak (or maximum) aerial survey estimates for 718 streams that had been observed at intervals during the salmon migration and spawning period (Van Alen 2000). Aerial survey observations were statistically adjusted through comparison of counting rates of the "index observers" to one another, so the estimates of the number of fish were comparable among observers and comparable with historical observations (Hofmeister 1998). These observations were referred to as the adjusted counts. The largest count for the year was then retained for each stream in the survey and termed the peak adjusted count for each stream. Adjustments were also

made for index streams for which no peak survey count was made, by imputing[1] (or interpolating) values from the existing set of index data. The index was made up of the peak adjusted counts and the imputed values, summed over this standard set of index streams. Escapement goals were established in 2003 for three large sub-regions of Southeast Alaska, based on the 2003 pink salmon index (Zadina et al. 2004). The escapement goals for Southeast Alaska were further divided into pink salmon escapement management targets on smaller spatial scales (stock groups within management districts) which are to aid managers in distributing escapement throughout the sub-regions. (These smaller "management targets" are not formal escapement goals.) Every three years, ADF&G is required to report to the Alaska Board of Fisheries about the escapement performance.

Unfortunately, it would not be possible for us to duplicate the 2003 index in its current form. The methods used to calculate the 2003 index were not formally documented in any detail. The annual pink salmon escapement index has been calculated in spreadsheets on a personal computer by the Southeast Alaska pink salmon program biologist, and the spreadsheet has been handed from one biologist to the next as staff have retired or moved on. Errors were almost certainly introduced over time through typos and manipulations of data in spreadsheets. Because the published statistics have only been released tri-annually in stock status reports to the Board of Fish (Zadina et al. 2004, Heinl and Geiger 2005), the published values are not current in most years. Access to escapement indices has otherwise been available directly from the pink salmon program biologist in the form of electronic data sets not subject to quality or version control. Salmon researchers, department staff, and the public would like access to current escapement information and would like some assurance that they are working with valid escapement statistics.

Our primary goal was to provide access to a variety of pink salmon escapement indices, reported on various spatial scales, through the Southeast Alaska Integrated Fisheries Database, and to formally document how the index was constructed. Our intent was to provide interested individuals our best escapement indices, calculated using the most current version of data within our regional database. In this way, everyone making a query (on the same version of the data) will be assured a reliable and consistent set of statistics that are officially sanctioned by ADF&G. Statistics that change over time will change because of intentional updates to the database. Working through this process also allowed us to critically examine how the 2003 index was constructed, and to make changes to the index as needed. We term the new index we are creating the "2009 index", because we intend to present it to the Alaska Board of Fisheries, together with updated escapement goals, in the year 2009.

OBJECTIVES

1. Designate each of the pink salmon index streams within the ADF&G Southeast Alaska Integrated Fisheries Database.
2. Provide a means to group index streams into (1) sub-regions, (2) management areas, (3) districts, and (4) stock groups, for the purpose of calculating and reporting an index on each of these spatial scales.

[1] Imputation is the statistical process of filling in missing values of an observation (in this case a peak survey count) based on valid values of other observations (e.g., see Brown and Kros 2003).

3. Update the list of index observers and provide a means to put an annual "observer calibration" number in for each of the index observers into the database.
4. Provide a means to allow managers to designate the "peak count" for each index stream on an annual basis with a coding system.
5. Provide a means to allow research staff to designate a "peak count" for years when a manager has not made this designation, using a code separate from the code the managers will use.
6. Provide a means to access the "observer calibration adjusted" and "peak adjusted" counts for each index stream in the database over a period of years.
7. Provide a means to impute a missing value for each index stream that does not have a suitable peak survey observation.
8. Provide a means to scale the index value to the lower end of the target range for district, stock group, and management area, or lower goal for sub-regions, on each specified spatial scale (sub-regions, management areas, districts, stock groups).
9. Provide an interface that will result in standard pink salmon escapement indices for Southeast Alaska from 1960 to the most current year on the named spatial scales (sub-regions, management areas, districts, stock groups).

SPATIAL DIVISIONS

Southeast Alaska pink salmon harvest statistics and escapement indices have commonly been partitioned into spatial areas that reflect fisheries management divisions (management areas, districts, and stock groups) as well as biological divisions (sub-regions). Because Southeast Alaska pink salmon are harvested primarily in mixed-stock fisheries, often some distance from spawning areas, it is not possible to allocate harvests of pink salmon to stock group of origin at any finer scale than sub-region. Therefore, biological escapement goals for Southeast Alaska pink salmon have been established at the sub-region level (Zadina et al. 2004). These sub-regional goals were further divided into "management targets" for the 12 management districts and 46 stock groups where pink salmon are monitored, as an aid to assessing the spatial distribution of the pink salmon escapement across Southeast Alaska (Zadina et al. 2004). These management targets are not considered to be escapement goals under the definition of the Statewide Salmon Escapement Goal Policy (5 AAC 39.223), but these targets are simply a kind of informal benchmark that can be used to assess the consistency of the distribution of the escapement within administrative boundaries.

MANAGEMENT AREAS

There are four management areas in Southeast Alaska (Juneau, Ketchikan, Petersburg, and Sitka; see Appendix A), which are further divided into 15 management districts (Districts 1–15). ADF&G Fisheries managers in Southeast Alaska are responsible for managing the fisheries and monitoring escapements of pink salmon in each of their respective management areas, and the districts or portions of the districts within their areas.

SUB-REGIONS

Marine tagging studies have repeatedly demonstrated that Southeast Alaska pink salmon stocks are strongly segregated into southern and northern areas or sub-regions (e.g., Rich 1927, Rich

and Suomela 1929, Rich and Morton 1930, Nakatani et al. 1975, Hoffman 1983), and the commercial fisheries in each sub-region generally target pink salmon stocks that ultimately spawn in that sub-region. The Southern Southeast sub-region comprises pink salmon stocks from Sumner Strait and south (Districts 1–8), while the Northern Southeast sub-region comprises pink salmon stocks north of Sumner Strait (Districts 9–15). In 1998, the northern area was further divided into Northern Southeast Inside and Northern Southeast Outside sub-regions, as marine tagging studies also showed that pink salmon spawning on the outer coast of Chichagof and Baranof islands do not enter inside waters (Nakatani et al. 1975, Alexandersdottir 1987). The Northern Southeast Outside sub-region includes all waters of District 13 (excluding Peril Straits and Hoonah Sound subdistricts 113-51 through 59, which are considered part of the Northern Southeast Inside sub-region).

STOCK GROUPS

Southeast Alaska has also been divided into 53 smaller "stock groups" contained within the district boundaries (Zadina et al. 2004). Each stock group is a collection of streams that have similar migration routes and run timing, are managed as a unit, and are assumed to share similar productivity and exploitation rates (Van Alen 2000). Seven of the pink salmon stock groups have not been monitored for pink salmon spawning escapements—the Annette Island stock group is managed exclusively by the Metlakatla Indian Community, and the state has no jurisdiction in that area, while six other stock groups are located in areas that do not have directed fisheries or are in remote areas where it would be cost prohibitive to conduct surveys on a regular basis: Suemez-Dall (Ketchikan area), SW Baranof, W Kruz, and W Yakobi (Sitka area), and Dundas Bay and Glacier Bay (Juneau area). The remaining 46 stock groups, representing 12 districts, are actively managed and monitored for escapements.

DESCRIPTION OF THE HISTORICAL 2003 INDEX

While we have general descriptions of how the 2003 index was constructed (Hofmeister 1998, Van Alen 2000, Zadina et al. 2004), the specific details of much of the process were not formally documented, particularly the observer calibrations and the strategies used to impute missing survey data from 1960 to 1997. We review other problems with the 2003 index in more detail in this section.

The 2003 pink salmon escapement index was based on a summation of the annual peak aerial survey counts for 718 index streams (selected from over 2,500 known pink salmon spawning streams in the region). Each of these streams was designated as an index stream if it was surveyed in a minimum of seven different years between 1986 and 1997 (Zadina et al. 2004). Although the index was represented by a wide variety of stream sizes, in terms of pink salmon production (Table 1), the streams in the index likely represent a large portion of the pink salmon production in the region. Only stream surveys conducted by key personnel, termed "index observers" were used in the index; an index observer being defined as an individual (typically a management biologist or assistant management biologist) who had conducted more than 100 stream surveys per year in more than four years (Hofmeister 1998; Appendix B.1).

Fish counts for each stream survey were divided into four categories: mouth, intertidal, stream live, and stream dead. Mouth counts normally consist of fish in saltwater that are in close proximity to the stream being surveyed, intertidal counts include fish in the area from low tide to the approximate high tide mark, and stream counts normally include all fish above the high tide

mark. Management biologists have typically entered their survey data into the ADF&G Southeast Alaska Integrated Fisheries Database (IFDB) at the end of the season.

Table 1.–Distribution of pink salmon escapement index streams based on the 1960–2002 median escapement peak survey value by stream.

Median Peak Survey Range	Number of Streams
< 500	21
500–2,500	173
2,500–5,000	141
5,000–10,000	161
10,000–25,000	140
25,000–100,000	77
> 100,000	5
Total Number of Streams	718

Since 1997, survey data have been qualified (based on visibility, timing, and area surveyed) by the management biologists that conducted the surveys using the following codes: code 01, an incomplete survey—not useful for indexing abundance; code 02, a complete survey—potentially useful for indexing abundance; and code 03, the peak survey—useful for indexing abundance. Code 03 surveys identified the one and only peak survey for a creek each year. The peak count includes all of the fish recorded on the survey in the mouth and intertidal areas, and live and dead fish in the stream itself. Management biologists have entered these codes into IFDB with the survey data making it easy to filter peak survey observations from the database.

OBSERVER CALIBRATIONS

It is well known that an individual observer tends to count at his or her own rate, or bias; e.g., two observers that survey the same creek on the same day will tend to have different impressions of how many fish are present (Dangel and Jones 1988, Jones et al. 1998, Bue et al. 1998). In 1997, raw stream survey counts were manipulated in an attempt to standardize as much of this observer bias as possible—not by removing bias, however, but rather by adjusting all observer counts within each of the four ADF&G Management Areas to the same bias level (Hofmeister 1998, Van Alen 2000). This method of calibrating index observers to each other to standardize the index counts appeared to be a reasonable and useful way to address observer counting bias. Individual observers' counts were calibrated to the counting rate of a principle observer in each management area through comparisons of all the surveys conducted by the observers of the same stream within a three-day period. The principal observers were the area management biologists in each of the four area offices in 1997. The principle observer's rate was set to 1.0 (i.e., not calibrated), and calibration adjustments were calculated for all index observers since 1960 as described by Hofmeister (1998):

> The method for relative bias correction was based on counts from all instances of pairs of observers flying the same stream within 3 days of each other. The bias comparisons were restricted to within management areas and only major observers were included in the evaluation. A major observer was defined as an observer who had flown more than 100 surveys per year more than 4 years. A power model $\left(y = \alpha x^{\beta}\right)$ was fit to the paired observations, and the β parameter used to evaluate if the relationship was nonlinear (β

significantly different than 1 at $\alpha = 0.05$). Relationships with significant nonlinearity were excluded from consideration. The relative bias correction factor was then computed as the slope of the line relating the current management biologist to the observer in question. The line was assumed to pass through the origin and the slope was calculated as the median of all y/x ratios (where y is the count of the current management biologist and x is the count of the observer in question). This estimator was used because it is robust to the presence of outliers. In cases when less than 20 survey overlaps existed between the current area management biologist and the observer in question, the bias correction factor was computed by algebraic manipulation of the relative bias of an observer common to both the management biologist and observer in question.

The calibrations for each index observer were used to adjust all of the surveys that each of the index observers conducted over their entire careers (the calibrations for each index observer are shown in Appendix B.1).

The specific details of much of this process were not formally documented, aside from general descriptions by Hofmeister (1998), Van Alen (2000), and Zadina et al. (2004), and we were not able to examine the actual historical data that were used to generate the observer calibrations. However, we were able to generate similar data sets using paired observations for all observers up to 2003. Our examination of these paired observations indicated that, in practice, these calibrations often did not produce the desired effect of bringing counts of managers from a single area office closer together, and it appeared that the calibrations tended to over-inflate the counts for many observers in the 1980s and 1990s. For example, in the case of two long-time management biologists from the Petersburg area, application of the observer calibration to the secondary observer had the effect of inflating the counts of the secondary observer well past the counting level of the principal observer (Table 2).

Conversely, the calibrations deflated the survey counts of the only two designated index observers in the Petersburg management area in the 1960s; both had calibrations that were less than one and the long-time Petersburg management biologist, Norm Johnston, had the lowest calibration (0.34) of all index observers (Appendix B.1). Multiplying this index observer's counts by 0.34 implies that this observer estimated three times more, on average, than the principal observer. We could find no evidence, however, that this observer counted three times more than other people, and the data in Table 3 show just one of many examples of this.

Because only the observers that could be calibrated to principal observers were used in the 2003 index, numerous, apparently valid survey counts by non-index observers were not used. Many management biologists from the 1960s could not be calibrated to the principal observer in each management area because there was no overlap in time with a calibrated index observer. Also, the current program of extensive surveying in conjunction with management of the purse seine fishery did not fully develop until the late 1970s, and area management biologists in the 1960s simply did not conduct as many aerial surveys as biologists now conduct on an annual basis; i.e., they did not conduct the required 100 stream surveys per year.

In our examination of the historical aerial survey data, we frequently found that the index count for a specific stream was simply the maximum observer-adjusted count, and not the actual peak count, despite the existence of a better estimate by a non-index observer (Table 3). This was particularly true for data from the 1960s and, aside from the lack of an observer-specific

calibration, there was often no obvious reason not to use a non-index observer's survey estimates.

Table 2.–Aerial survey counts by two index observers for Eagle Creek in 1999. Note the reasonable progression of observed total counts by date to the peak count of 260,000 on September 27. In the 2003 index, these surveys were adjusted using observer-specific calibrations; observer B's counts were multiplied by 2.44 to adjust them to match observer A (the principle observer). As a result of this calibration, observer B's largest count was adjusted from 200,000 to 488,000 and that adjusted count was used as the 1999 peak survey datum for Eagle Creek—despite the fact that this adjusted count was nearly twice the size of any of the observed counts and clearly not an accurate adjustment.

Year	Stream	Date	Species	Mouth	Tidal	Live	Dead	Total	Observer	Adjusted Count
1999	Eagle Creek	8/2/1999	Pink	0	0	0	0	0	A	0
1999	Eagle Creek	8/5/1999	Pink	500	0	0	0	500	B	1,220
1999	Eagle Creek	8/12/1999	Pink	0	600	0	0	600	B	1,464
1999	Eagle Creek	8/27/1999	Pink	0	4,000	40,000	0	44,000	A	44,000
1999	Eagle Creek	8/30/1999	Pink	0	5,000	95,000	0	100,000	A	100,000
1999	Eagle Creek	9/9/1999	Pink	0	0	130,000	0	130,000	A	130,000
1999	Eagle Creek	9/14/1999	Pink	0	0	200,000	0	200,000	B	488,000
1999	Eagle Creek	9/27/1999	Pink	0	0	250,000	10,000	260,000	A	260,000
1999 Pink salmon index count for Eagle Ck =									B	488,000

Table 3.–Aerial survey counts by two observers for Kell Bay Creek in 1964. Observer A was designated as an index observer in the 2003 index, while observer B was not; thus, only observer A's counts were used, while observer B's counts were not used. Observer A's surveys were multiplied by 0.34 to adjust them to a principle observer (not shown here). As a result of this calibration, observer A's largest count was adjusted downward from 250 fish to 85 fish and that adjusted count was used as the 1964 peak survey datum for Kell Bay Creek—despite the fact that this adjusted count clearly did not represent the peak of the run at Kell Bay Creek in 1964.

Year	Stream	Date	Species	Mouth	Tidal	Live	Dead	Total	Observer	Adjusted Total
1964	Kell Bay Creek	8/4/1964	Pink	0	250	0	0	250	A	85
1964	Kell Bay Creek	8/6/1964	Pink	30	0	150	0	180	B	-
1964	Kell Bay Creek	8/13/1964	Pink	12,500	0	0	0	12,500	B	-
1964	Kell Bay Creek	8/18/1964	Pink	17,500	6,000	5,000	0	28,500	B	-
1964	Kell Bay Creek	8/27/1964	Pink	20,000	12,000	10,000	0	42,000	B	-
1964 Pink salmon index count for Kell Bay Creek =									A	85

We found that when multiple observers from the same office conducted surveys of the same stream during the same year, their counts were often in line with each other with respect to the natural progression of run-timing and build-up of fish in a stream (e.g., Tables 2–4); however, when a calibration was applied with the intention of bringing the counts closer together, the new adjusted peak count no longer represented the true peak of the run. The high frequency of this type of occurrence also suggested that the observer calibrations did not work as intended. The observer calibrations tended to induce substantial error into the process when any observer other than the principle observer collected the peak escapement count.

Another problem that we identified with the observer calibrations was that surveys conducted within three days of each other may not have been comparable due to the fact that numbers of pink salmon in a stream can change significantly in a very short period of time (Table 5). In a simple experiment, we compared pairs of surveys all conducted by the same principal observer within a three-day period; e.g., all of the paired instances in which Philip S. Doherty (the principal observer in the Ketchikan Management Area) flew the same creek twice within a three-day period. In that case, the observer-calibration algorithm produced a calibration as large as those for many of the calibrated index observers. Clearly, this method of calibration did not account for changes in survey estimates as a result of natural changes in fish abundance over the course of the season.

Table 4.–Aerial survey counts by two observers for Anan Creek in 1965. Observer A was designated as an index observer in the 2003 index, while observer B was not; thus, only observer A's counts were used, while observer B's counts were not used. Observer A's surveys were multiplied by 0.34 to adjust them to a principle observer (not shown here). As a result of this calibration, observer A's largest count was adjusted downward from 95,000 fish to 32,300 fish and that adjusted count was used as the 1965 peak survey datum for Anan Creek—despite the fact that this adjusted count clearly did not represent the relative abundance of pink salmon as shown by the counts of both observers.

Year	Stream	Date	Species	Mouth	Tidal	Live	Dead	Total	Observer	Adjusted Count
1965	Anan Creek	7/12/1965	Pink	0	2,000	1,500	0	3,500	A	1,190
1965	Anan Creek	7/21/1965	Pink	0	1,000	40,000	0	41,000	B	-
1965	Anan Creek	7/24/1965	Pink	2,000	800	41,000	0	43,800	B	-
1965	Anan Creek	7/29/1965	Pink	0	500	49,000	0	49,500	B	-
1965	Anan Creek	8/2/1965	Pink	10,000	1,000	47,000	0	58,000	B	-
1965	Anan Creek	8/5/1965	Pink	2,000	1,500	69,000	0	72,500	B	-
1965	Anan Creek	8/10/1965	Pink	4,000	4,000	87,000	0	95,000	A	32,300
1965	Anan Creek	8/16/1965	Pink	0	800	83,000	0	83,800	B	-
1965	Anan Creek	8/26/1965	Pink	0	0	93,000	0	93,000	B	-
1965 Pink salmon index count for Annan Creek =									A	32,300

One factor that makes this calibration method difficult to apply in practice is the unlikelihood that any observer's counts capture a consistent fraction of fish present in the numerous streams surveyed each season, particularly over varying run-sizes. It was assumed that observer counting rates are consistent and do no change over time. The calibrations were not based on comparison of survey estimates to the actual numbers of fish in a creek, but rather to a principle observer's level of counting, which may or may not have been any more accurate than the secondary observer's counts.

Table 5.–Comparison of pairs of surveys conducted on the same stream exactly three days apart by one principle observer (Philip S. Doherty) in 1997 and 1998. Note that in most instances the second count was substantially larger than the first count, suggesting that large numbers of fish had moved into the creek during the intervening three-day period.

Observer	Year	Stream	1st Date	1st Count (*X*)	2nd Date	2nd Count (*Y*)	*Y/X*
PSD	1997	Herman Creek	25-Jul	1,500	28-Jul	25,000	16.7
PSD	1997	Traitors Cove Creek	8-Aug	20,000	11-Aug	32,000	1.6
PSD	1997	Traitors Cove Creek	16-Aug	33,000	19-Aug	35,600	1.1
PSD	1997	Naha River	8-Aug	8,000	11-Aug	7,800	1.0
PSD	1997	Klakas Inlet W Side	26-Aug	12,500	29-Aug	12,000	1.0
PSD	1997	Klakas Right Head	26-Aug	65,000	29-Aug	125,000	1.9
PSD	1997	Nutkwa Creek	18-Aug	38,000	20-Aug	61,000	1.6
PSD	1997	Waterfall Creek N	26-Aug	1,200	29-Aug	8,000	6.7
PSD	1997	Shinaku Creek	26-Aug	50,000	29-Aug	45,000	0.9
PSD	1997	Big Salt Lk N Side L	26-Aug	12,000	29-Aug	36,000	3.0
PSD	1997	Big Salt Lk N Side M	26-Aug	18,000	29-Aug	42,000	2.3
PSD	1997	Klawock River	26-Aug	25,000	29-Aug	90,000	3.6
PSD	1997	Staney Creek	26-Aug	65,000	29-Aug	185,000	2.8
PSD	1998	Dall Head Creek	13-Aug	1,600	16-Aug	4,000	2.5
PSD	1998	Cabin Creek	25-Jul	1,200	28-Jul	3,800	3.2
PSD	1998	Wilson River	25-Jul	68,000	28-Jul	77,000	1.1
PSD	1998	Heckman Creek	30-Jul	1,400	2-Aug	3,800	2.7
Median							2.3

During studies of aerial observer counting rates at Chaik and Traitors creeks (1995–1997,1999, and 2004–2006; ADF&G unpublished data), the typical index observer exhibited considerable variation in accuracy when aerial survey estimates of fish in a closed study area were compared directly to the number of fish actually present (Table 6). In these two-day studies, an area of the creek was closed off at either end by fences, and mark-recapture methods were used to estimate the population of live salmon within the closed study area. Fish were marked throughout the study area on one day and fish were recaptured and examined for marks the following day. Index observers flew aerial surveys over the closed study area during the two-day study, and their estimates were then compared to the estimated population of live fish in the study area. Jones et al. (1998) described similar aerial survey studies at Chaik Creek, 1992–1994.

Three observers who participated in six of the seven studies showed substantial year-to-year variation; e.g., estimates by observer E ranged from 118% above to 54% below the actual number of fish present in the study area (Table 6). For eight observers who participated in all three years of the study at Traitors Creek, the accuracy of each observer and the degree to which they under- or over-counted fluctuated each season. At Traitors Creek, observer I's estimates ranked first or second in accuracy of the eight observers in all three years, however, at Chaik Creek observer I never ranked in the top three for accuracy and in 1996 this observer ranked last in that category (Table 6). Most of the observers were far less consistent as far as accuracy was concerned; e.g., in 2004, observer M ranked second out of the eight observers who participated in all three years of the closed-population study at Traitors Creek, but ranked last in both 2005 and 2006 (Table 6). Additionally, observer M had the lowest estimate in 2005 and the highest estimate in 2006. Most of the other observers fluctuated between these extremes, but the relationship between individual observer's counts appears to defy simple attempts at creating

individually-specific calibrations; particularly calibrations that attempt to adjust one observer's counts to the same level as another observer, as was done for the 2003 pink salmon index.

Table 6.–Relative bias of aerial survey estimates of pink salmon inside a closed study area compared to the mark-recapture estimate of pink salmon within the closed study area at Chaik Creek, 1995–1999, and Traitors Creek, 2004–2006 (ADF&G unpublished data).

	Relative Bias						
Index Observer	**1995**	**1996**	**1997**	**1999**	**2004**	**2005**	**2006**
A	-24%	28%	-7%				
B	-36%	-23%		-35%			
C	-51%						
D		-42%	-9%	-69%	-45%		
E		-48%	-44%	-43%	118%	-54%	23%
F		-42%	-52%		-42%		
G		-37%	-39%	-2%			
H		-45%	-27%	-26%	-37%	-57%	46%
I		-65%	-39%	-62%	-23%	17%	-15%
J			69%				-12%
K				-45%		-80%	-20%
L				-81%			
M					28%	-81%	69%
N					-48%	-64%	24%
O					-42%	-9%	-60%
P					-65%	-72%	-58%
Q						-60%	
R						-52%	-33%
S						-64%	62%

Finally, it would be difficult to carry this calibration method forward into the future given the potential for frequent personnel changes with no overlap in time, and the fact that changes in the principal observers at each office would require the index to be completely re-calculated. Also, because each area office was calibrated to a different principle observer, the 2003 index actually consisted of four components (Juneau, Sitka, Petersburg, and Ketchikan management areas) scaled to different levels. As a result of our examination, we chose to completely eliminate the use of the observer adjustments as they were used in the 2003 index, and simply use the raw survey data until such time that a suitable method of adjusting survey estimates can be devised.

IMPUTING MISSING VALUES

For several reasons, it was not possible to designate a peak survey for every index stream in every year. In some cases a stream was not surveyed during the peak of the run, or the survey during the peak of the run was not useful due to weather or it was an incomplete survey—or the stream was simply not surveyed at all. In other instances, a stream was not surveyed by an index observer at the appropriate time. There were many more missing values from 1960 to the mid-1970s than for later years. The number of streams known to support pink salmon runs grew over the decades after the inception of pink salmon research programs that started in the 1960s. Thus, some pink salmon index streams simply were not known to have pink salmon in them in the 1960s and early 1970s. Also, the current program of extensive surveying in conjunction with management of the purse seine fishery did not fully develop until the late 1970s, and area

management biologists in the 1960s simply did not conduct as many aerial surveys as biologists now conduct on an annual basis.

The issue of missing data must be addressed, because the escapement index would not be comparable from year to year if there was not a value for all the streams in the index. If a particular index stream was missing a peak escapement count for any given year, a value was imputed from existing data. It was assumed that the expected count for a given stream in a given year was equal to the sum of all counts for that stream, times the sum of all the counts in a given year for all the streams in the unit of interest, divided by the sum of all counts over all years for all the streams in the unit of interest (e.g., stock group, district, or sub-region). Data were arranged in a matrix, and the missing value was calculated as the row total times the column total divided by the grand total (see example in Table 7). An iterative EM algorithm (McLachlan and Krishnan 1997) was used to calculate missing values, because there was typically more than one missing value for each unit of interest, and the sums change as missing values are filled in at each iteration. This method was based on an assumed multiplicative relation between yearly count and unit count, with no interaction.

We do not know exactly what strategies were used to impute missing values in the 2003 pink salmon index when it was initially constructed, and this is one of the main reasons that it would not be possible for us to duplicate the 2003 index. For example, we do not know if all missing values were imputed at once for the entire index over all years or if values were imputed over blocks of years (e.g., decades), nor do we know if missing values were imputed for the entire region at once, or for sub-regions or management areas or districts.

Table 7.–An iterative EM algorithm was used to impute missing peak survey values from existing data. In this example, the shaded cells denote missing peak survey values that were imputed from the survey information shown here for index streams in the Ratz Harbor pink salmon stock group. The missing value for Sal Creek in 1973 was assumed to be equal to the sum of all counts for Sal Creek, 1973–1979 (row total), times the sum of all stream counts in the Ratz Harbor stock group in 1973 (column total), divided by the sum of all counts for all streams in the Ratz Harbor stock group, 1973–1979 (grand total). Since the table has more than one missing value, an iterative procedure was used because the sums change as each missing value is calculated. The calculations are repeated until the missing values converge at a solution.

		Peak Survey Count							Row
Stock Group	**Stream**	**1973**	**1974**	**1975**	**1976**	**1977**	**1978**	**1979**	**Total**
Ratz Harbor	Sal Creek	941	408	340	5,000	785	16,250	5,050	28,774
Ratz Harbor	Little Ratz Creek	727	408	340	1,020	2,880	14,560	2,300	22,235
Ratz Harbor	Ratz Hbr Creek	5,304	7,344	3,100	20,000	23,300	28,600	15,000	102,648
Ratz Harbor	Eagle Ck Luck Lake	2,040	6,800	2,997	20,000	40,000	24,000	26,000	121,837
Column Total		9,013	14,960	6,777	46,020	66,965	83,410	48,350	**Grand Total** 275,495

We also discovered that all of the values for the Juneau management area from 1960 to 1964 were imputed, and all but one value in 1965 was imputed, which equated to 971 imputed values. What looked like real survey values were included in the index for Marble Creek each year from 1960 to 1965, despite the fact that this creek was not surveyed in those years, and we suspect that these "dummy" values were inserted to help seed the process of imputing missing values. We do not know what the dummy values were based on. We could not find any explanation, but we assume that this large block of information was imputed because none of the aerial observers in

the Juneau management area from the early 1960s could be calibrated to other index observers; e.g., there were no Juneau management area index observers identified from 1960 to 1964 (Appendix B.1). Thus, none of the actual 1960–1965 stream survey information from the Juneau management area was used in the 2003 pink salmon index; information that to us appeared perfectly reasonable to use and no better or worse than the information from other management areas during the same time period.

THE NEW 2009 PINK SALMON INDEX

INDEX STREAMS

The 2009 pink salmon escapement index will consist of 714 index streams (Appendix C). Each of the index streams will be linked in the database to the named spatial divisions described above—sub-region, management area, district, and stock group—to allow calculation and reporting of the index on each of these spatial scales.

This list of streams is four less than the 2003 index. We added three new streams to the index based on recommendations by area management biologists: Navy Creek (106-22-016), W Crawfish N Arm NE (113-32-004), and False Island Creek (113-51-004). The following streams were previously included in the 2003 index, but were removed because managers felt they could not obtain reliable survey estimates due to consistent poor visibility from the air: Karta River (102-60-87), Thorne River (102-70-058), Klawock River (103-60-047), Neck Lake Creek (106-35-075), Gunnuck Creek (109-42-004), 2nd West of Sanborn Creek (110-34-011), and Nakwasina Sound Mid Head Creek (113-43-003).

INDEX OBSERVERS

A total of 48 index observers will be used in the 2009 pink salmon escapement index (Appendix B2). We added fourteen observers that were not included in the 2003 index, and all but three were active during the 1960s. All of the new index observers were area management biologists (12) or pink salmon research biologists (two). We consulted with long-time area management biologists before adding new observers to the list, as in many cases these management biologists were familiar with the observers in question.

OBSERVER CALIBRATIONS

The database table of index observers will also provide a means for research staff to easily enter annual individual index observer calibrations into the regional database. Surveys by each index observer will then be linked in the database to their annual calibration factors, and stream surveys by an index observer will automatically be expanded by that factor. For the 2009 pink salmon escapement index, however, we set the initial calibrations for each index observer to "1;" i.e., surveys will not be calibrated. Although the method that was used to calibrate observers to each other and adjust counts in the 2003 index seemed like a useful way to address observer counting bias, the application of this method presented many drawbacks, as discussed above.

DESIGNATION OF PEAK SURVEY ESTIMATES

In order for the pink salmon index to be calculated automatically out of IFDB, each annual peak survey for each index stream had to be manually designated in the database. As described earlier, survey data entered into IFDB since 1997 have been qualified (based on visibility, timing, and area surveyed) by the management biologists that conducted the surveys through the use of a coding system. The designation of code 03 identified a single survey for each stream as the one

and only peak count for a particular index stream. We examined all of the surveys for each index stream since 1997, to ensure that the peak survey code applied to each index stream made sense with regard to run timing and that each index stream had only one peak survey identified. In cases for which we had questions about surveys or coding, we consulted with the management biologists familiar with the surveys or the area prior to making any changes.

Surveys conducted prior to 1997 were not coded at all. In preparing the 2009 pink salmon index, we examined the entire historic set of surveys for each index stream, from 1960 to 1996, and manually designated the annual peak survey count for each index stream, when possible. In the process of identifying appropriate peak surveys, we typically assessed run-timing for each index stream through examination of all years of available data for each stream, and also through examination of data for adjacent index streams. Surveys identified as a peak survey by the research staff were given a new code, "04 Peak survey—assigned by research staff," to indicate that a manager did not make the designation.

In addition to our work, William Bergmann, the Petersburg area ADF&G management biologist since 1976, coded every single survey conducted in the Petersburg management area, from 1967 to 2007 (codes 01, 02, and 03). Mr. Bergmann made these designations through examination of the original escapement survey forms on file at the Petersburg office. This process also allowed him to double-check the original forms against the database and to correct numerous data entry errors.

IMPUTING MISSING VALUES

The method for automatically imputing missing values in the 2009 index was based on the same basic methods and assumptions as was used in the 2003 index (see above and Table 7). Imputation of missing data in the 2009 index was made at the level of sub-region, which corresponds to the biological pink salmon escapement goals for Southeast Alaska. The imputed values were designated in the database with a new code: "05—imputed value," so that they will be clearly identified as extrapolated data.

Once all of the missing values were imputed, we reviewed the entire index once again. This review was conducted by charting the new index series against the old 2003 index series for each of the 46 pink salmon stock groups. In cases where there were large differences between the two series, we double-checked the index values (the peak surveys) for each index stream in the stock group to ensure that there were no errors in coding and that imputed values made sense. Most of the differences between the two index series were due to the elimination of the observer calibrations and the addition of more observers in the 1960s. The number of imputed values was greatest from 1960 to 1976 when an average of 67% of the annual index values were imputed (Figure 1). The number of real survey values increased starting in 1977. The proportion of real survey values used in the index averaged 64% from 1977 to 1984, and has averaged 77% since 1985 (range 67% to 87%).

A final IFDB table was populated with the 1960–2007 provisional peak survey values that included all of the peak, pink salmon escapement index surveys; i.e., those surveys with the designation codes 03 (peak value assigned by a manager), 04 (peak value assigned by research staff), and 05 (imputed value). The 2009 pink salmon index was then set, or fixed, in the database—the index numbers will not be changed until such time as it is deemed appropriate to do so.

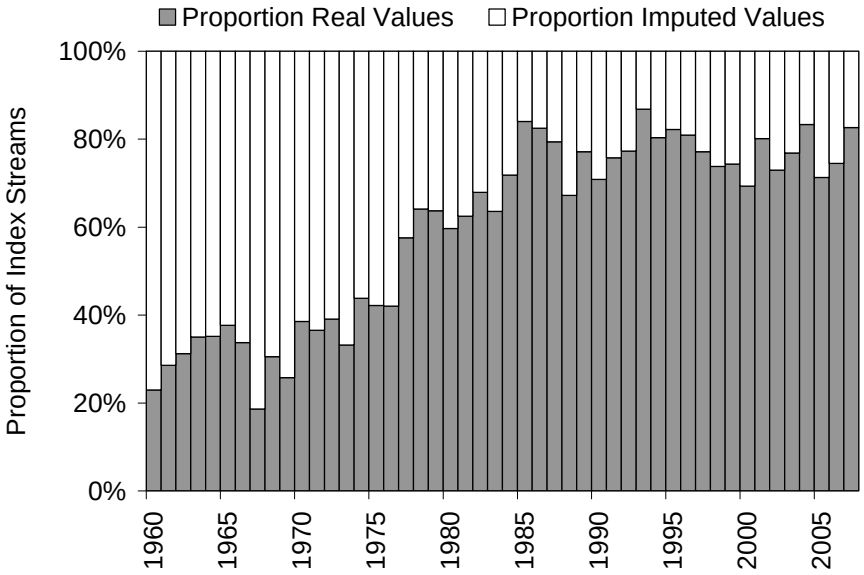

Figure 1.–Proportion of real peak survey values compared to imputed values used annually in the 2009 pink salmon escapement index. There are a total of 714 pink salmon streams in the index.

Table 8.–Example of an IFDB report of escapement goals and index values for the northern southeast inside sub-region, 1980–1985 (based on the 2003 pink salmon escapement index). The annual sub-region index values equal the sum of the peak surveys to all of the index streams in the northern southeast inside sub-region. The annual scaled index values equal the annual stock index divided by the lower bound of the escapement goal (2,500,000). Note that scaled index values less than 1.0 denote indices that did not meet the lower bound of the escapement goal (e.g., 1980 and 1981), while scaled index values of 1.0 and greater denote indices that exceeded the lower bound of the escapement goal (e.g., 1982–1985).

Sub-Region	Lower Goal	Upper Goal	Year	Sub-Region Index	Scaled Index
NSE Inside	2,500,000	5,500,000	1980	1,742,219	0.70
NSE Inside	2,500,000	5,500,000	1981	2,001,448	0.80
NSE Inside	2,500,000	5,500,000	1982	2,985,055	1.19
NSE Inside	2,500,000	5,500,000	1983	2,735,122	1.09
NSE Inside	2,500,000	5,500,000	1984	2,652,636	1.06
NSE Inside	2,500,000	5,500,000	1985	5,894,780	2.36

SCALING THE INDEX

The Southeast Alaska pink salmon escapement index does not provide an estimate of total escapement or true abundance—the escapement index we have is only a relative measure; therefore, it may be more appropriate in some circumstances to present pink salmon indices in units that do not represent numbers of fish. We chose to scale the index values to the lower bounds of the specific escapement goals or management targets for each of the named spatial divisions (sub-region, district, and stock group). A scaled index value of less than 1.0 represents an index value that was below the lower range of the escapement goal or management target, while a scaled index value of 1.0 or greater represents an index value that met or exceeded the lower bound of the escapement goal or management target. This step transforms all of the index

values to the same units, no matter which spatial division is represented, and one can immediately see how the index in a particular area performed in a given year by simply noting how the scaled index value compared to a value of 1.0. Pink salmon index reports from IFDB will include both the standard escapement index values and the scaled values for each of the named spatial divisions (sub-region, district, and stock group; see Table 8).

DISCUSSION

The new 2009 pink salmon escapement index exhibits the same general trends as earlier versions of the pink salmon index (Figure 2), but with some noticeable differences. Although the 2009 pink salmon index for the Northern Southeast Outside sub-region looks very similar to the old 2003 pink salmon index (Figure 3), the new indices for the Southern Southeast and Northern Southeast Inside sub-regions, show slightly higher values for the 1960s–1970s, and slightly lower values for the 1980s–1990s, with respect to the old 2003 index (Figures 4–5). These differences are due to elimination of the observer calibrations and to the addition of more index observers from the 1960s.

The observer calibrations used in the 2003 index had the effect of inflating the counts of observers in the 1980s and 1990s, and deflating the counts of some observers in the 1960s, particularly in the Petersburg management area. The Petersburg management area is centrally located in the region, and managers there are responsible for surveying streams that are located in both the Northern Southeast Inside and Southern Southeast sub-regions. Adding more index observers from the 1960s also made many more peak surveys available for use in the index.

Although we eliminated the observer calibrations from the 2009 pink salmon escapement index, we do not wish to imply that the new index is free of observer counting bias. On the contrary, surveyors generally underestimate the number of fish in the stream for a variety of reasons, and the degree of bias increases as the density of fish increases (Bevan 1961, Cousens et al. 1982, Symons and Waldichuk 1984, Dangel and Jones 1988, Bue et al. 1998, Jones et al. 1998). Calibrations to correct for observer counting bias would ideally be based on a comparison of observer counts to the number of fish actually present in a stream or in a study area, rather than adjusting observer counts to one another.

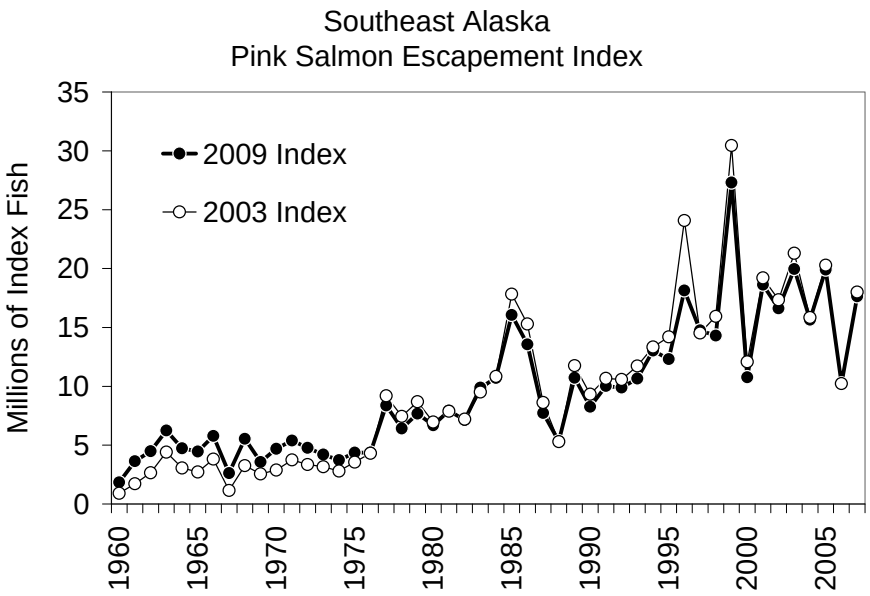

Figure 2.–Comparison of the new 2009 pink salmon escapement index and the old 2003 index for all Southeast Alaska pink salmon index streams combined.

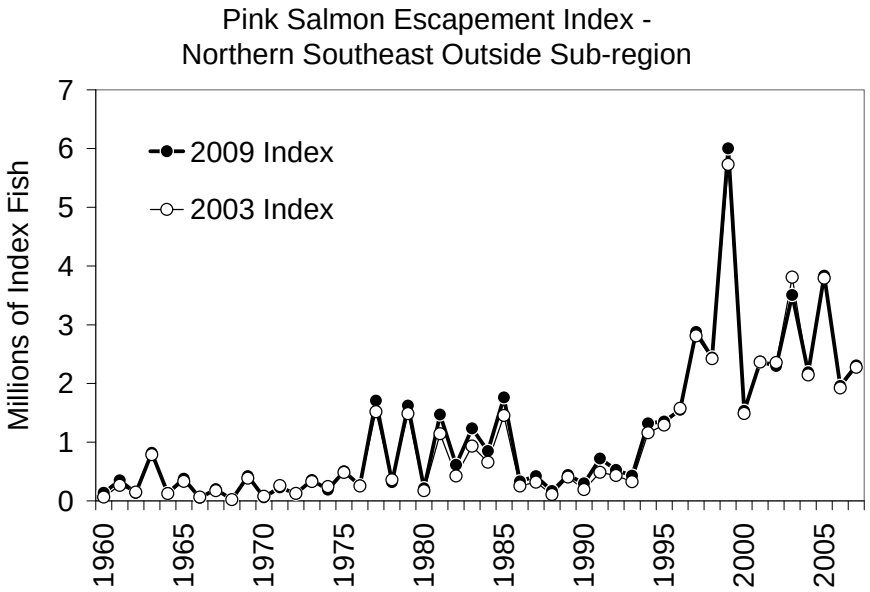

Figure 3.–Comparison of the new 2009 pink salmon escapement index and the old 2003 index for the northern southeast outside sub-region.

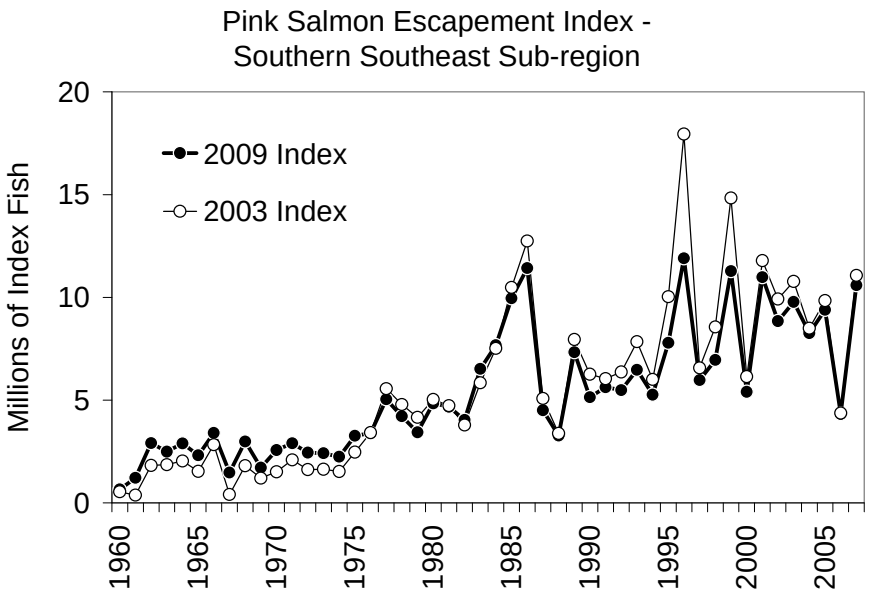

Figure 4.–Comparison of the new 2009 pink salmon escapement index and the old 2003 index for the southern southeast sub-region.

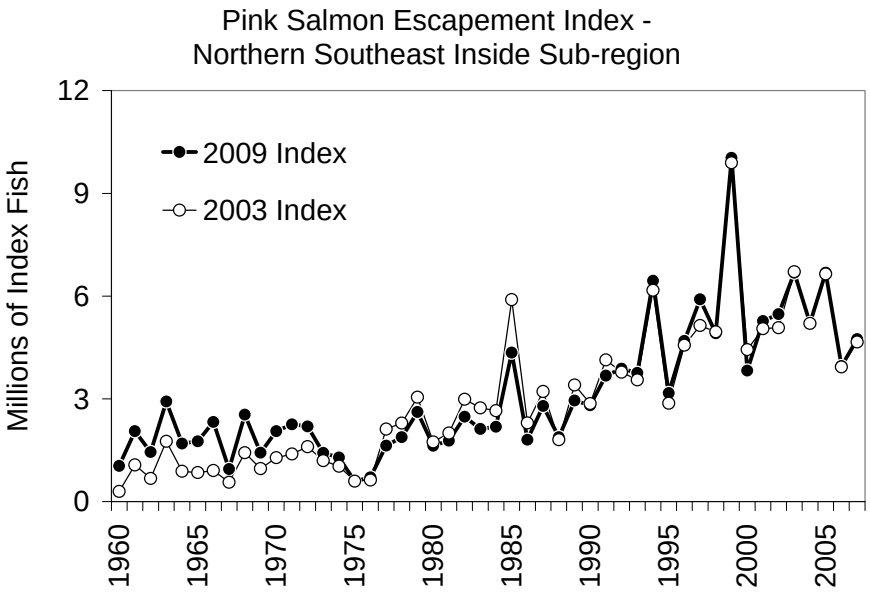

Figure 5.–Comparison of the new 2009 pink salmon escapement index and the old 2003 index for the northern southeast inside sub-region.

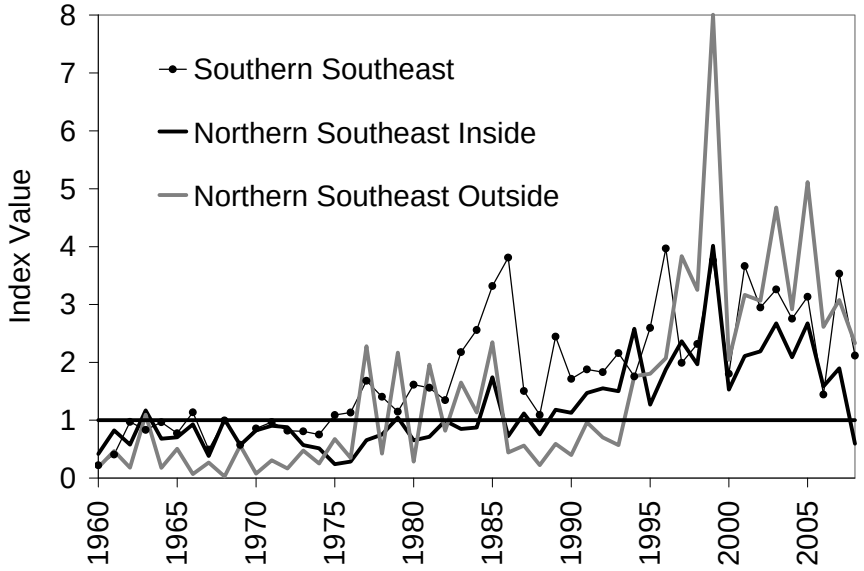

Figure 6.–Southeast Alaska pink salmon escapement indices scaled to the lower bound of the escapement goal for each sub-region, 1960–2007. An index value of 1 indicates that the index was equal to the lower bound of the escapement goal (the horizontal line).

We feel that we have improved the Southeast Alaska pink salmon escapement index through the removal of the observer calibrations, and additions of more index observers, which makes better use of the available survey data. Automation of the index in the regional database should reduce data entry errors and other errors induced through manipulations of spreadsheets and will make it possible for anyone to reproduce the index. Automation of the pink salmon index will now provide users access to standard pink salmon escapement indices for Southeast Alaska from 1960 to the most current year on a number of different spatial divisions. Scaled versions of these indices will also be available from the regional database (Figure 6).

At the end of the 2008 field season, the ADF&G fisheries managers will enter their pink salmon aerial surveys into the database and qualify the surveys with the following codes: code 01, an incomplete survey—not useful for indexing abundance; code 02, a complete survey—potentially useful for indexing abundance; and code 03, the peak survey—useful for indexing abundance. Managers will identify exactly one peak aerial survey for each pink salmon index stream and designate that survey with the code 03. The missing data algorithm will be run in the database against the current year's set of peak surveys and the static table of historic data (1960–2007) to impute missing values for the streams that do not have a peak survey identified in 2008. The managers and research staff will then review the data to check for errors. Once this review is completed, the imputed values will be designated with code 05, so that they will be identifiable in the database as extrapolated data. The 2008 index will be finalized and added to the static table of historic data, 1960–2007. This process will be repeated annually.

ACKNOWLEDGEMENTS

The need to critically examine how the old pink salmon escapement index was constructed and the benefits of automating the index out of the Southeast Alaska regional database were ideas

that were set in motion by the forward-thinking Hal Geiger, who retired before this project was completed. The great organizational skills of Martina Kallenberger were instrumental in getting this project on track to be completed. We would like to thank Scott Johnson who patiently and efficiently developed new database tables and wrote the necessary programs to allow for automation of the pink salmon index; his work now allows us to download pink salmon escapement indices from the database anytime we wish. We also thank Scott for his review of this manuscript. Jeff Kelly built the data management forms for entering and coding the escapement surveys into the database, and Jim Blick, formerly a biometrician with ADF&G (Division of Commercial Fisheries, Douglas), provided assistance with the algorithm used to impute missing values in the database. We would particularly like to acknowledge the incredible amount of work that William Bergmann performed in his review and coding of every single salmon survey conducted in the Petersburg Management Area since 1967—and Shelly Sokol, who, without complaint, coded every single one of those thousands and thousands of Petersburg surveys in the database. Mr. Bergmann also reviewed this report, and provided advice and ideas that improved the work that we did. We also thank Tyler Cronk, Hillary Hook, and Lucy Leitz for the many hours they spent coding peak pink salmon survey data in the regional database, and Doug Eggers who also reviewed the final draft of this report.

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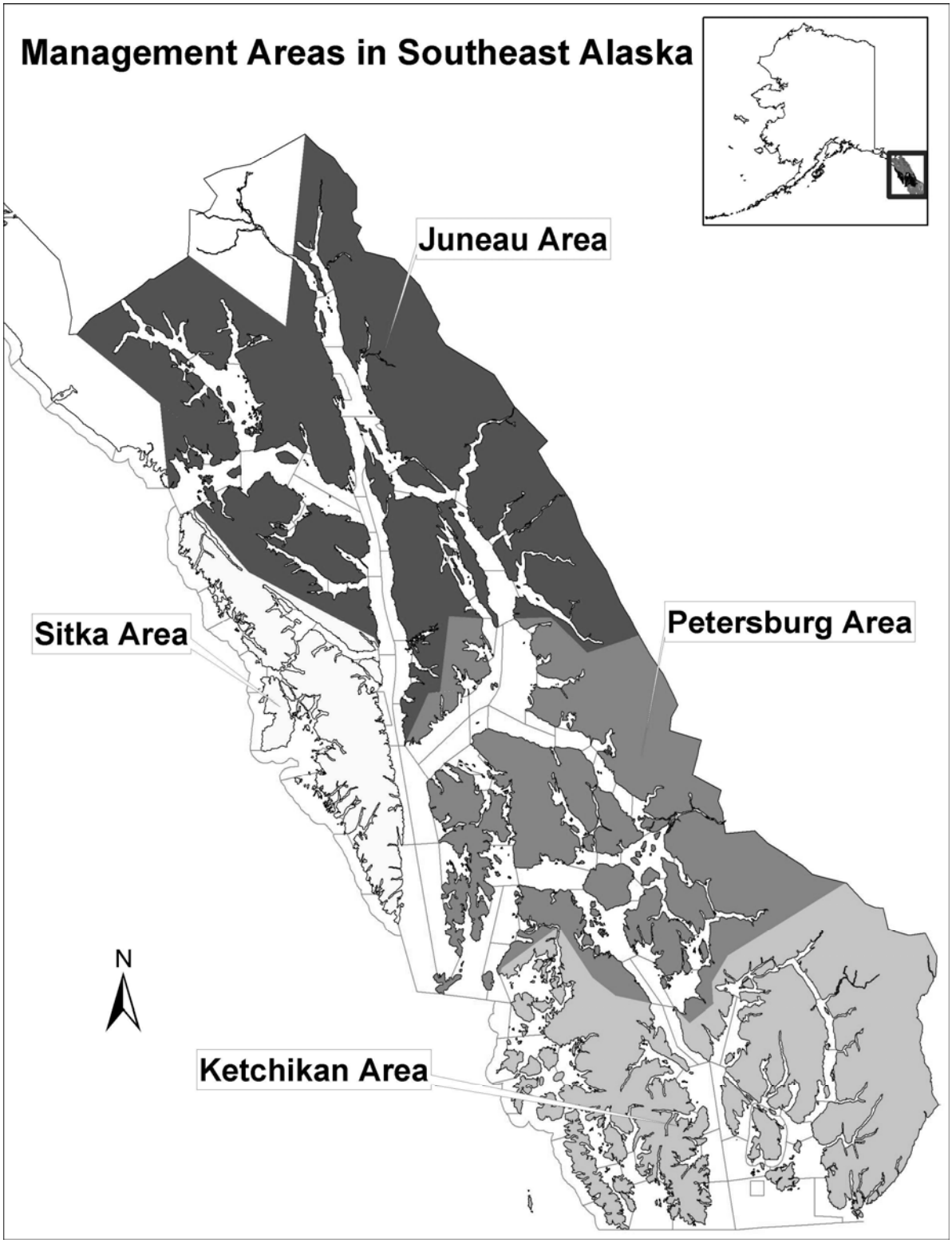
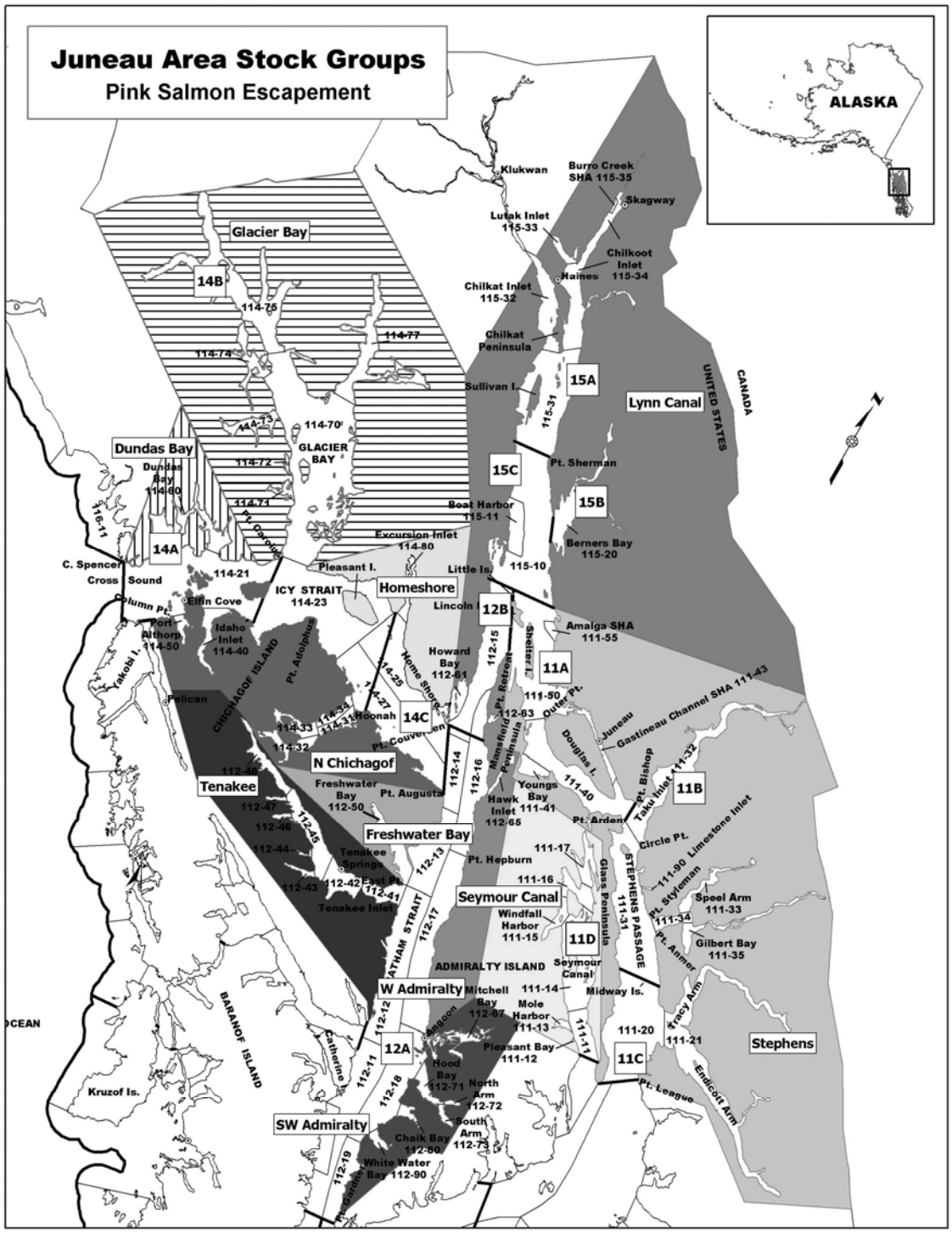
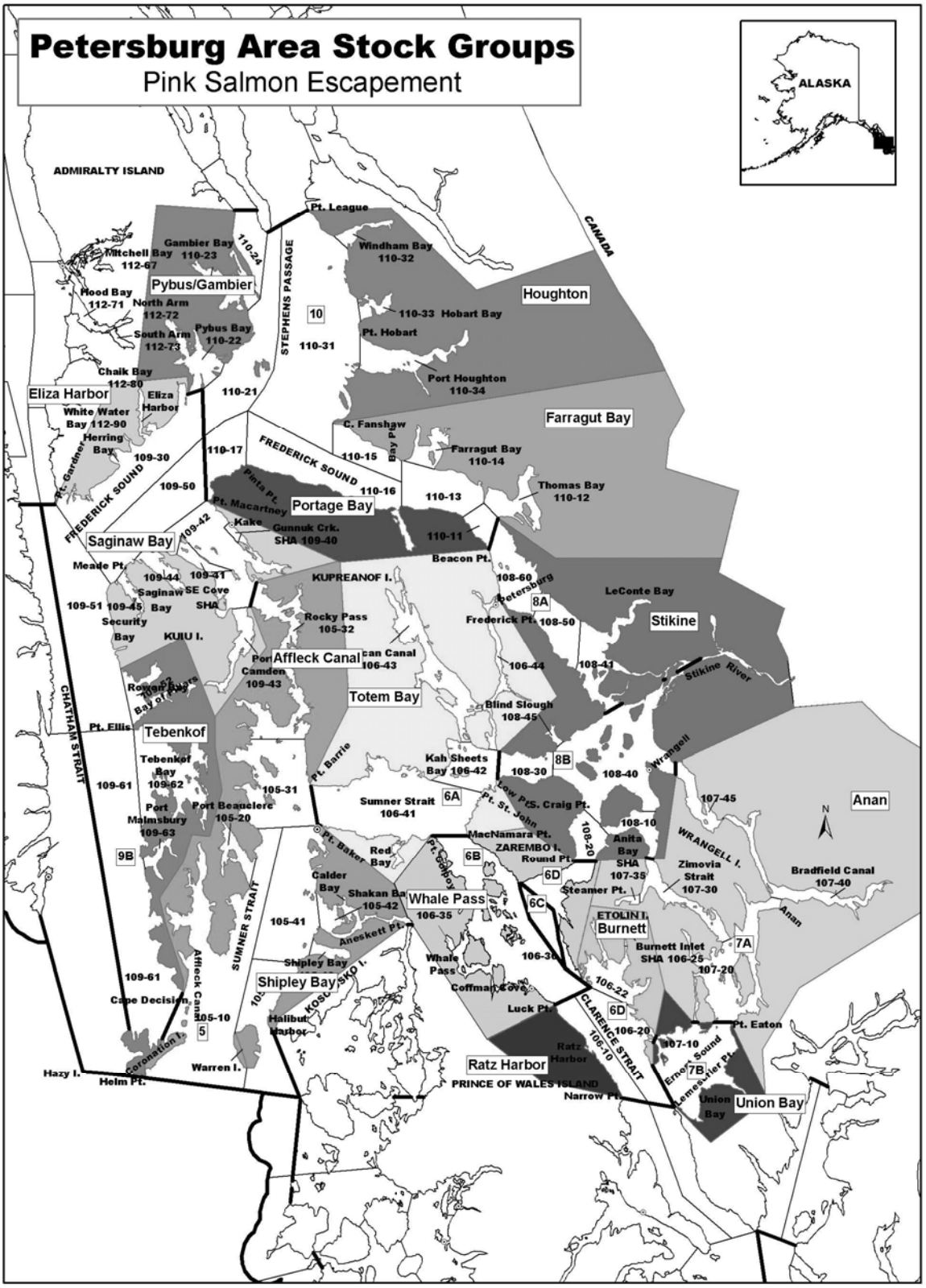
APPENDIX A



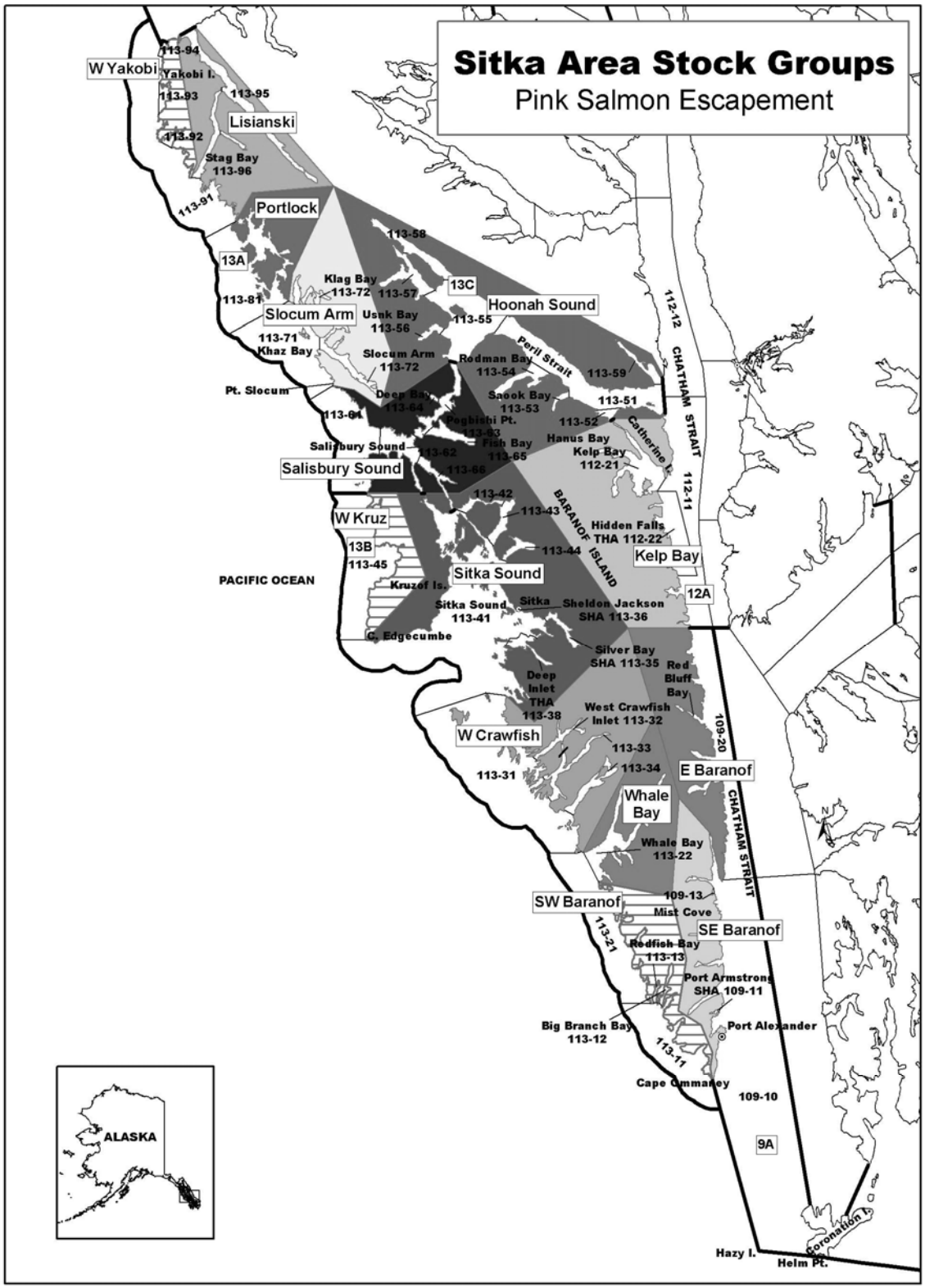
Appendix A.1–ADF&G salmon management areas in Southeast Alaska.



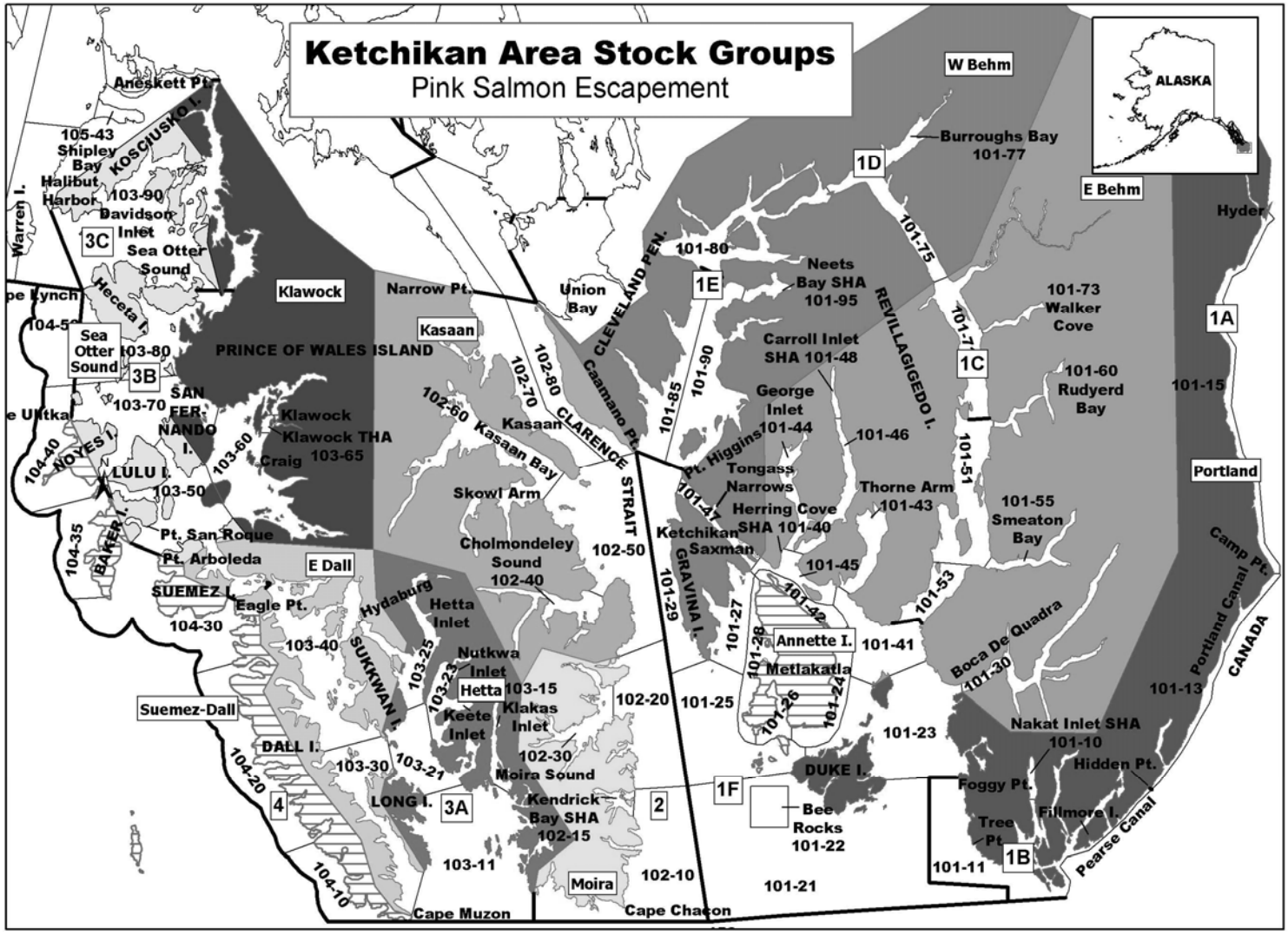
Appendix A.2.–The ADF&G Juneau salmon management area and associated pink salmon escapement stock groups. Vertically and horizontally hatched stock groups indicate areas with no index streams or escapement targets.



Appendix A.3.–The ADF&G Petersburg salmon management area and associated pink salmon escapement stock groups.



Appendix A.4.–The ADF&G Sitka salmon management area and associated pink salmon escapement stock groups. Horizontally hatched stock groups indicate areas with no index streams or escapement targets.



Appendix A.5.–The ADF&G Ketchikan salmon management area and associated pink salmon escapement stock groups. Horizontally hatched stock groups indicate areas with no index streams or escapement targets.

APPENDIX B

Appendix B.1.–Index observers and calibration statistics used in the 2003 Southeast Alaska pink salmon escapement index. Bold font indicates the designated principal observer for each area office.

Initials	Name	Position	Area Office	Calibration	Years in Index	Number of Surveys
NJ	Norm Johnston	Manager	Petersburg	0.34	1960–1972	2,277
BB	Brad Brahy	Assistant	Wrangell	0.68	1968–1976	731
BEB	Barry E. Bracken	Assistant	Petersburg	1.3	1976–1978	431
BLL	Brian L. Lynch	Assistant	Petersburg	2.44	1991–2000	1,215
RCL	Robert C. Larson	Assistant	Petersburg	1.14	1985–1990	905
RLT	Randy L. Timothy	Assistant	Wrangell	1.04	1977–1996	557
WRB	**William R. Bergmann**	**Manager**	**Petersburg**	**1**	**1972–2005**	**17,761**
TST	Troy S. Thynes	Assistant	Petersburg	1	2001–2005	646
SNF	Scott N. Forbes	Assistant	Wrangell	1	2005	42
CLR	Carl L. Rosier	Manager	Ketchikan	1.11	1960–1969	554
JPV	John P. Valentine	Manager	Ketchikan	0.96	1962–1988	6,066
PSD	**Philip S. Doherty**	**Manager**	**Ketchikan**	**1**	**1980–2005**	**11,093**
EDH	E. Don House	Assistant	Ketchikan	1.64	1983–2001	4,418
EDH	E. Don House	Assistant	Ketchikan	1.17	2002	
EDH	E. Don House	Assistant	Ketchikan	1.35	2003	
RDJ	Robert DeJong	Assistant	Ketchikan	1.75	1977–1979	535
JJB	Jim Barry	Assistant	Ketchikan	0.74	1970–1974	629
KF	Kim Francisco	Assistant	Ketchikan	1.65	1977–1981	656
JWB	Justin W. Breese	Assistant	Ketchikan	1	2003–2005	218
SBW	Scott B. Walker	Assistant	Ketchikan	1.83	1991–2001	1,134
SBW	Scott B. Walker	Assistant	Ketchikan	1.5	2002	
BLM	Bo L. Meredith	Assistant	Ketchikan	1	2005	
JP	Jim Parker	Manager	Sitka	1	1960–1979	2,958
RDJ	Robert DeJong	Manager	Sitka	0.79	1980–1994	4,716
WMD	**William M. Davidson**	**Manager**	**Sitka**	**1**	**1992–2003**	**2,812**
DAG	Dave A. Gordon	Assistant	Sitka	1	1996–2001	1,463
DAG	Dave A. Gordon	Assistant	Sitka	1.21	2002	
DAG	Dave A. Gordon	Assistant	Sitka	1.17	2003	
DAG	Dave A. Gordon	Manager	Sitka	1	2004–2005	
EEC	Eric C. Coonradt	Assistant	Sitka	1	2005	
TR	Tom Richardson	Manager	Juneau	1	1965–1970	529
DC	Dave C. Cantillon	Manager	Juneau	1	1968–1978	959
DJI	Don J. Ingledue	Manager	Juneau	1.98	1974–1994	5,549
AJM	**Andrew J. McGregor**	**Manager**	**Juneau**	**1**	**1994–2003**	**2,082**
CWF	Craig W. Farrington	Manager	Juneau	1.03	1999–2002	748
KJM	Kevin J. Monagle	Manager	Juneau	1	2003–2005	362
JJM	Joe J. Muir	Assistant	Juneau	1.6	1978–1985	3,898
JJM	Joe J. Muir	Assistant	Juneau	0.83	1986–1998	
SJS	Scott J. Sloan	Assistant	Juneau	1	2002	52
KII	Ken I. Imamura	Assistant	Juneau	2.2	1980–1985	575
DKH	Dave K. Harris	Assistant	Juneau	1	2004–2005	
RFS	Ray F. Staska	Assistant	Haines	1.92	1974–1996	460
MSK	M. Scott Kelley	Manager	Haines; Juneau	1	2001–2005	234
RLB	Randall L. Bachman	Manager	Haines	1	1999–2005	51

Appendix B.2.–Index observers used in the 2009 pink salmon index. The names of observers that were not included in the 2003 index for each area are shown in bold.

Initials	Name	Area Management Office	Observer Calibration	Index Years
APK	**Alan P. Kingsbury**	Petersburg	1	1972-1976
BB	Brad Brahy	Petersburg	1	1968-1976
BEB	Barry E. Bracken	Petersburg	1	1976-1978
BLL	Brian L. Lynch	Petersburg	1	1991-2000
CLR	**Carl L. Rosier**	Petersburg	1	1960-1962
JRE	**John Edgington**	Petersburg	1	1973-1975
KED	**Ken E. Durley**	Petersburg	1	1967-1973
LBJ	**Larry B. Jennings**	Petersburg	1	1966-1967
N-J	Norm Johnston	Petersburg	1	1960-1975
PST	**Paul S. Tate**	Petersburg	1	1968-1972
RCL	Robert C. Larson	Petersburg	1	1985-1990
RLT	Randy L. Timothy	Petersburg	1	1977-1996
SNF	Scott N. Forbes	Petersburg	1	2003-2007
THR	**Tom H. Richardson**	Petersburg	1	1963-1965
TST	Troy S. Thynes	Petersburg	1	2001-2007
WRB	William R. Bergmann	Petersburg	1	1972-2007
APK	**Alan P. Kingsbury**	Ketchikan	1	1972-1976
BLM	Bo L. Meredith	Ketchikan	1	2005-2007
CLR	**Carl L. Rosier**	Ketchikan	1	1960-1975
EDH	E. Don House	Ketchikan	1	1982-2004
EGK	**Ed Klickhart**	Ketchikan	1	1960-1962
JJB	Jim Barry	Ketchikan	1	1970-1974
JPV	John P. Valentine	Ketchikan	1	1962-1988
JWB	Justin W. Breese	Ketchikan	1	2003-2007
K-F	Kim Francisco	Ketchikan	1	1977-1981
LRS	**Lyle R. Simpson**	Ketchikan	1	1961-1967
MSK	M. Scott Kelley	Ketchikan	1	2001-2007
PSD	Philip S. Doherty	Ketchikan	1	1980-2006
RDJ	Robert DeJong	Ketchikan	1	1977-1979
SBW	Scott B. Walker	Ketchikan	1	1991-2002, 2007
WRB	William R. Bergmann	Ketchikan	1	1972-2007
APK	**Alan P. Kingsbury**	Sitka	1	1972-1976
DAG	Dave A. Gordon	Sitka	1	1996-2007
EEC	Eric C. Coonradt	Sitka	1	2005-2007
E-H	**Ed Huizer**	Sitka	1	1960-1962
JFP	Jim Parker	Sitka	1	1960-1979
KED	**Ken E. Durley**	Sitka	1	1971-1973
RDJ	Robert DeJong	Sitka	1	1980-1994
WMD	William M. Davidson	Sitka	1	1992-2004
WRB	William R. Bergmann	Sitka	1	1972-2007
AJM	Andrew J. McGregor	Juneau	1	1994-2007
APK	**Alan P. Kingsbury**	Juneau	1	1972-1976
C-L	**Carl Lehman**	Juneau	1	1964-1966
CWF	Craig W. Farrington	Juneau	1	1999-2002
DCC	Dave C. Cantillon	Juneau	1	1968-1978
DJI	Don J. Ingledue	Juneau	1	1974-1994
DKH	Dave K. Harris	Juneau	1	2003-2007
E-H	**Ed Huizer**	Juneau	1	1960-1967
JFP	**Jim Parker**	Juneau	1	1960-1962

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Appendix B.2.–Continued (page 2 of 2)

Initials	Name	Area Management Office	Observer Calibration	Index Years
JJM	Joe J. Muir	Juneau	1	1978-1998
KED	**Ken E. Durley**	Juneau	1	1971-1973
KII	Ken I. Imamura	Juneau	1	1980-1989
KJM	Kevin J. Monagle	Juneau	1	2003-2007
L-H	**LH, Unknown**	Juneau	1	1963
M-M	**MM, Unknown**	Juneau	1	1964
MSK	M. Scott Kelley	Juneau	1	2001-2007
N-J	Norm Johnston	Juneau	1	1960-1975
RFS	Ray F. Staska	Juneau	1	1974-1996
RLB	Randall L. Bachman	Juneau	1	1999-2007
R-P	**RP, Unknown**	Juneau	1	1967
SCS	**S. C. Smedley**	Juneau	1	1963-1965
THR	Tom H. Richardson	Juneau	1	1965-1970
WRB	William R. Bergmann	Juneau	1	1972-2007

APPENDIX C

Appendix C.1.–2009 Pink Salmon Index Streams.

STOCK-CODE	STOCK	DISTRICT	SUB-DISTRICT	STREAM CODE	STREAM	AREA OFFICE	SUB-REGION
122	Portland Pink	101	11	14	Harry Bay	Ketchikan	SSE
122	Portland Pink	101	11	65	Willard Creek	Ketchikan	SSE
122	Portland Pink	101	11	78	Fillmore Inlet NW Hd	Ketchikan	SSE
122	Portland Pink	101	11	79	Fillmore Creek	Ketchikan	SSE
122	Portland Pink	101	11	100	Swift Creek	Ketchikan	SSE
122	Portland Pink	101	11	101	Hidden Inlet	Ketchikan	SSE
122	Portland Pink	101	15	8	Sandfly Creek	Ketchikan	SSE
122	Portland Pink	101	15	11	Star Creek	Ketchikan	SSE
122	Portland Pink	101	15	14	Halibut Bay N Head	Ketchikan	SSE
122	Portland Pink	101	15	19	Tombstone River	Ketchikan	SSE
122	Portland Pink	101	15	85	Fish Creek-Hyder	Ketchikan	SSE
122	Portland Pink	101	23	19	Very Inlet N Head	Ketchikan	SSE
122	Portland Pink	101	23	23	Very Inlet E Head	Ketchikan	SSE
122	Portland Pink	101	23	27	Very Inlet SE Head	Ketchikan	SSE
122	Portland Pink	101	23	32	Very Inlet	Ketchikan	SSE
122	Portland Pink	101	23	34	Very Inlet	Ketchikan	SSE
142	W Behm Pink	101	27	19	Dall Head Creek	Ketchikan	SSE
142	W Behm Pink	101	27	26	Bostwick Bay SW Side	Ketchikan	SSE
142	W Behm Pink	101	27	36	Bostwick Creek	Ketchikan	SSE
142	W Behm Pink	101	29	6	Vallenar Creek	Ketchikan	SSE
142	W Behm Pink	101	29	11	Grant Creek	Ketchikan	SSE
105	E Behm Pink	101	30	5	Quadra Creek	Ketchikan	SSE
105	E Behm Pink	101	30	9	Weasel Cove Head	Ketchikan	SSE
105	E Behm Pink	101	30	12	Badger Bay Head	Ketchikan	SSE
105	E Behm Pink	101	30	30	Keta River	Ketchikan	SSE
105	E Behm Pink	101	30	60	Marten River	Ketchikan	SSE
105	E Behm Pink	101	30	83	Humpback Creek	Ketchikan	SSE
105	E Behm Pink	101	30	89	Mink Creek	Ketchikan	SSE
105	E Behm Pink	101	30	95	Vixen Bay Head	Ketchikan	SSE
105	E Behm Pink	101	41	25	Lucky Cove	Ketchikan	SSE
105	E Behm Pink	101	43	29	Pop Creek	Ketchikan	SSE
105	E Behm Pink	101	43	33	Fish Creek Thorne A	Ketchikan	SSE
105	E Behm Pink	101	43	41	Sea Level Creek	Ketchikan	SSE
105	E Behm Pink	101	45	7	Herring Cove	Ketchikan	SSE

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Appendix C.1.–(page 2 of 22)

STOCK-CODE	STOCK	DISTRICT	SUB-DISTRICT	STREAM CODE	STREAM	AREA OFFICE	SUB-REGION
105	E Behm Pink	101	45	24	White River	Ketchikan	SSE
105	E Behm Pink	101	45	32	Leask Creek	Ketchikan	SSE
105	E Behm Pink	101	45	38	Salt Chuck George In	Ketchikan	SSE
105	E Behm Pink	101	45	42	Salt Lagoon Right	Ketchikan	SSE
105	E Behm Pink	101	45	75	Nigelius Creek	Ketchikan	SSE
105	E Behm Pink	101	45	78	Carroll Creek	Ketchikan	SSE
105	E Behm Pink	101	45	94	Spit Creek	Ketchikan	SSE
105	E Behm Pink	101	51	6	Checats Creek	Ketchikan	SSE
105	E Behm Pink	101	55	9	Cabin Creek	Ketchikan	SSE
105	E Behm Pink	101	55	20	Wilson River	Ketchikan	SSE
105	E Behm Pink	101	55	40	Blossom River	Ketchikan	SSE
105	E Behm Pink	101	55	60	Bakewell Creek	Ketchikan	SSE
105	E Behm Pink	101	55	83	Red Creek	Ketchikan	SSE
105	E Behm Pink	101	55	87	Skull Creek	Ketchikan	SSE
105	E Behm Pink	101	60	9	Nooya Creek	Ketchikan	SSE
105	E Behm Pink	101	60	15	Rudyerd Creek	Ketchikan	SSE
105	E Behm Pink	101	60	20	Sandpiper Creek	Ketchikan	SSE
105	E Behm Pink	101	60	25	Valentine Creek	Ketchikan	SSE
105	E Behm Pink	101	60	30	Big Goat Creek	Ketchikan	SSE
105	E Behm Pink	101	71	25	Walker Cove L Head	Ketchikan	SSE
105	E Behm Pink	101	71	26	Walker Cove R Head	Ketchikan	SSE
105	E Behm Pink	101	71	28	Walker Creek	Ketchikan	SSE
105	E Behm Pink	101	71	50	Grace Creek	Ketchikan	SSE
105	E Behm Pink	101	71	63	Portage Creek	Ketchikan	SSE
105	E Behm Pink	101	71	04C	Clear Creek	Ketchikan	SSE
105	E Behm Pink	101	71	04E	Choca Creek	Ketchikan	SSE
105	E Behm Pink	101	71	04H	Humpy Creek	Ketchikan	SSE
105	E Behm Pink	101	71	04K	King Creek	Ketchikan	SSE
142	W Behm Pink	101	75	5	Herman Creek	Ketchikan	SSE
142	W Behm Pink	101	75	10	Grant Creek	Ketchikan	SSE
142	W Behm Pink	101	75	15	Eulachon River	Ketchikan	SSE
142	W Behm Pink	101	75	50	Klahini River	Ketchikan	SSE
142	W Behm Pink	101	75	76	Saks Creek	Ketchikan	SSE
142	W Behm Pink	101	80	3	Cow Creek	Ketchikan	SSE

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Appendix C.1.–(page 3 of 22)

STOCK-CODE	STOCK	DISTRICT	SUB-DISTRICT	STREAM CODE	STREAM	AREA OFFICE	SUB-REGION
142	W Behm Pink	101	80	40	Wasta Creek	Ketchikan	SSE
142	W Behm Pink	101	80	50	Spacious Bay R Head	Ketchikan	SSE
142	W Behm Pink	101	80	52	Margarita Creek	Ketchikan	SSE
142	W Behm Pink	101	80	60	Sea Lion Cove	Ketchikan	SSE
142	W Behm Pink	101	80	84	Short Creek	Ketchikan	SSE
142	W Behm Pink	101	90	29	Traitors Cove Creek	Ketchikan	SSE
142	W Behm Pink	101	90	39	Marguerite Creek	Ketchikan	SSE
142	W Behm Pink	101	90	48	Loring Creek	Ketchikan	SSE
142	W Behm Pink	101	90	50	Naha River	Ketchikan	SSE
142	W Behm Pink	101	90	60	Wolf Creek	Ketchikan	SSE
142	W Behm Pink	101	90	61	Moser Bay	Ketchikan	SSE
142	W Behm Pink	101	90	68	Lunch Creek	Ketchikan	SSE
142	W Behm Pink	101	90	71	Bond Bay South	Ketchikan	SSE
142	W Behm Pink	101	90	72	Bond Bay North	Ketchikan	SSE
142	W Behm Pink	101	90	75	Smugglers Creek	Ketchikan	SSE
142	W Behm Pink	101	90	76	Falls Ck/Smuggler Cv	Ketchikan	SSE
142	W Behm Pink	101	90	80	Helm Bay Head	Ketchikan	SSE
142	W Behm Pink	101	90	84	Helm Lake Creek	Ketchikan	SSE
142	W Behm Pink	101	90	86	Granite Ck/Raymnd Cv	Ketchikan	SSE
142	W Behm Pink	101	90	90	Deanna Creek	Ketchikan	SSE
142	W Behm Pink	101	90	92	Stewart Creek	Ketchikan	SSE
142	W Behm Pink	101	90	96	Heckman Creek	Ketchikan	SSE
142	W Behm Pink	101	90	97	Heckman Point North	Ketchikan	SSE
119	Moira Pink	102	30	17	Johnson Cove Creek	Ketchikan	SSE
119	Moira Pink	102	30	28	Perkins Creek	Ketchikan	SSE
119	Moira Pink	102	30	35	Moira S Arm Head SE	Ketchikan	SSE
119	Moira Pink	102	30	37	Moira S Arm Head S	Ketchikan	SSE
119	Moira Pink	102	30	43	Sick Creek	Ketchikan	SSE
119	Moira Pink	102	30	51	Frederick Creek	Ketchikan	SSE
119	Moira Pink	102	30	61	Dickman Bay Head	Ketchikan	SSE
119	Moira Pink	102	30	63	Dickman Bay	Ketchikan	SSE
119	Moira Pink	102	30	65	Kugel Creek	Ketchikan	SSE
119	Moira Pink	102	30	67	Kegan Cove	Ketchikan	SSE
119	Moira Pink	102	30	87	Aiken Cove	Ketchikan	SSE

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Appendix C.1.–Continued (page 4 of 22)

STOCK-CODE	STOCK	DISTRICT	SUB-DISTRICT	STREAM CODE	STREAM	AREA OFFICE	SUB-REGION
119	Moira Pink	102	30	89	Miller Lake Creek	Ketchikan	SSE
114	Kasaan Pink	102	40	7	Lancaster Cove East	Ketchikan	SSE
114	Kasaan Pink	102	40	9	Lancaster Cove East	Ketchikan	SSE
114	Kasaan Pink	102	40	11	Lancaster Cove East	Ketchikan	SSE
114	Kasaan Pink	102	40	13	Kitkun Bay NE Side	Ketchikan	SSE
114	Kasaan Pink	102	40	17	Kitkun Bay	Ketchikan	SSE
114	Kasaan Pink	102	40	43	Disappearance Creek	Ketchikan	SSE
114	Kasaan Pink	102	40	47	W of Disappearance	Ketchikan	SSE
114	Kasaan Pink	102	40	52	Cannery Creek W Arm	Ketchikan	SSE
114	Kasaan Pink	102	40	60	Lagoon Creek	Ketchikan	SSE
114	Kasaan Pink	102	40	71	W Arm Chol Sd Head	Ketchikan	SSE
114	Kasaan Pink	102	40	73	W Arm Chol Sd Head	Ketchikan	SSE
114	Kasaan Pink	102	40	87	Sunny Creek	Ketchikan	SSE
114	Kasaan Pink	102	60	5	Saltery Cove Creek	Ketchikan	SSE
114	Kasaan Pink	102	60	7	S Hd Saltery Cove Ck	Ketchikan	SSE
114	Kasaan Pink	102	60	14	McKenzie Creek	Ketchikan	SSE
114	Kasaan Pink	102	60	16	Omar Creek	Ketchikan	SSE
114	Kasaan Pink	102	60	24	Old Tom Creek	Ketchikan	SSE
114	Kasaan Pink	102	60	30	Goose Bay Creek	Ketchikan	SSE
114	Kasaan Pink	102	60	37	Rock Creek	Ketchikan	SSE
114	Kasaan Pink	102	60	38	Dog Salmon Creek	Ketchikan	SSE
114	Kasaan Pink	102	60	39	142F Creek	Ketchikan	SSE
114	Kasaan Pink	102	60	42	Cabin Creek Polk In	Ketchikan	SSE
114	Kasaan Pink	102	60	68	Kina Creek	Ketchikan	SSE
114	Kasaan Pink	102	60	72	Twelvemile Creek	Ketchikan	SSE
114	Kasaan Pink	102	60	82	Harris River	Ketchikan	SSE
114	Kasaan Pink	102	60	84	Maybeso Creek	Ketchikan	SSE
114	Kasaan Pink	102	60	99	Kasaan Village Creek	Ketchikan	SSE
114	Kasaan Pink	102	70	28	Windfall Creek	Ketchikan	SSE
110	Hetta Pink	103	11	17	Hunter Bay E Head	Ketchikan	SSE
110	Hetta Pink	103	11	35	Little Datzkoo Head	Ketchikan	SSE
110	Hetta Pink	103	11	41	Datzkoo Harbor Head	Ketchikan	SSE
110	Hetta Pink	103	15	10	Klakas Inlet W Side	Ketchikan	SSE
110	Hetta Pink	103	15	14	Klakas Inlet W Side	Ketchikan	SSE

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Appendix C.1.–Continued (page 5 of 22)

STOCK-CODE	STOCK	DISTRICT	SUB-DISTRICT	STREAM CODE	STREAM	AREA OFFICE	SUB-REGION
110	Hetta Pink	103	15	16	Klakas Left Head	Ketchikan	SSE
110	Hetta Pink	103	15	19	Klakas Head	Ketchikan	SSE
110	Hetta Pink	103	15	23	Klakas Right Head	Ketchikan	SSE
110	Hetta Pink	103	15	27	Klakas Lake Creek	Ketchikan	SSE
110	Hetta Pinkp	103	21	5	Nutkwa Creek North	Ketchikan	SSE
110	Hetta Pink	103	21	8	Nutkwa Creek	Ketchikan	SSE
106	E Dall Pink	103	25	5	Saltery Creek	Ketchikan	SSE
110	Hetta Pink	103	25	15	Deer Creek	Ketchikan	SSE
110	Hetta Pink	103	25	30	Hetta Portage Creek	Ketchikan	SSE
110	Hetta Pink	103	25	41	Coppermount Harbor	Ketchikan	SSE
110	Hetta Pink	103	25	47	Hetta Lake Creek	Ketchikan	SSE
106	E Dall Pink	103	30	35	Ham Cove Creek	Ketchikan	SSE
106	E Dall Pink	103	30	40	Grace Harbor Creek	Ketchikan	SSE
106	E Dall Pink	103	30	43	Vesta Bay	Ketchikan	SSE
106	E Dall Pink	103	30	46	Rose Inlet	Ketchikan	SSE
106	E Dall Pink	103	40	1	Barry Creek	Ketchikan	SSE
106	E Dall Pink	103	40	2	Tlevak Creek	Ketchikan	SSE
106	E Dall Pink	103	40	3	Soda Bay NW Side R	Ketchikan	SSE
106	E Dall Pink	103	40	9	Shelikof Creek	Ketchikan	SSE
106	E Dall Pink	103	40	13	Soda Creek	Ketchikan	SSE
106	E Dall Pink	103	40	30	Flat Creek	Ketchikan	SSE
106	E Dall Pink	103	40	33	Natzuhini N Center	Ketchikan	SSE
106	E Dall Pink	103	40	35	Natzuhini NE Corner	Ketchikan	SSE
106	E Dall Pink	103	40	39	Natzuhini Bay E Side	Ketchikan	SSE
106	E Dall Pink	103	40	41	Hydaburg River	Ketchikan	SSE
106	E Dall Pink	103	40	64	N of Rose Point Ck	Ketchikan	SSE
106	E Dall Pink	103	40	71	South View Cove	Ketchikan	SSE
106	E Dall Pink	103	40	73	View Cove Head	Ketchikan	SSE
106	E Dall Pink	103	40	78	Breezy Bay South	Ketchikan	SSE
106	E Dall Pink	103	40	80	Breezy Bay Head	Ketchikan	SSE
106	E Dall Pink	103	40	84	Farallon Bay W Head	Ketchikan	SSE
106	E Dall Pink	103	40	86	North Bay	Ketchikan	SSE
106	E Dall Pink	103	40	89	Lively Creek	Ketchikan	SSE
116	Klawock Pink	103	50	21	Port Estrella Head	Ketchikan	SSE

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Appendix C.1.–Continued (page 6 of 22)

STOCK-CODE	STOCK	DISTRICT	SUB-DISTRICT	STREAM CODE	STREAM	AREA OFFICE	SUB-REGION
116	Klawock Pink	103	50	22	Port Estrella R Head	Ketchikan	SSE
106	E Dall Pink	103	50	27	Waterfall Creek N	Ketchikan	SSE
106	E Dall Pink	103	50	29	Waterfall Creek S	Ketchikan	SSE
106	E Dall Pink	103	50	32	E of Waterfall Creek	Ketchikan	SSE
106	E Dall Pink	103	50	35	Ulloa Bay	Ketchikan	SSE
106	E Dall Pink	103	50	42	Port Refugio E Arm	Ketchikan	SSE
106	E Dall Pink	103	50	44	Port Refugio W Arm R	Ketchikan	SSE
106	E Dall Pink	103	50	47	Port Refugio W Arm S	Ketchikan	SSE
106	E Dall Pink	103	50	49	Port Refugio W Arm H	Ketchikan	SSE
106	E Dall Pink	103	50	51	Port Refugio North	Ketchikan	SSE
130	Sea Otter Sound Pink	103	50	58	Port Delores	Ketchikan	SSE
116	Klawock Pink	103	60	3	Picnic Bay	Ketchikan	SSE
116	Klawock Pink	103	60	9	Shinaku Inlet	Ketchikan	SSE
116	Klawock Pink	103	60	11	Shinaku Inlet N Side	Ketchikan	SSE
116	Klawock Pink	103	60	13	Shinaku Creek	Ketchikan	SSE
116	Klawock Pink	103	60	25	Big Salt Lk N Side L	Ketchikan	SSE
116	Klawock Pink	103	60	27	Big Salt Lk N Side M	Ketchikan	SSE
116	Klawock Pink	103	60	29	Steelhead Creek	Ketchikan	SSE
116	Klawock Pink	103	60	31	Blackbear Ck Big Slt	Ketchikan	SSE
116	Klawock Pink	103	60	35	Dog Salmon Creek	Ketchikan	SSE
116	Klawock Pink	103	60	37	Big Salt Lk SW Side	Ketchikan	SSE
116	Klawock Pink	103	60	41	Airport Ck N Klawock	Ketchikan	SSE
116	Klawock Pink	103	60	43	Airport Ck S Klawock	Ketchikan	SSE
116	Klawock Pink	103	60	50	Crab Bay at Craig	Ketchikan	SSE
116	Klawock Pink	103	60	57	St Nicholas N Side	Ketchikan	SSE
116	Klawock Pink	103	60	59	Port St Nicholas Hd	Ketchikan	SSE
116	Klawock Pink	103	60	65	Doyle Creek	Ketchikan	SSE
116	Klawock Pink	103	60	66	Doyle Bay East Side	Ketchikan	SSE
116	Klawock Pink	103	60	71	Trocadero B NW Side	Ketchikan	SSE
116	Klawock Pink	103	60	73	Trocadero B N Side	Ketchikan	SSE
116	Klawock Pink	103	60	75	Trocadero Bay	Ketchikan	SSE
116	Klawock Pink	103	60	77	Trocadero B R Head	Ketchikan	SSE
116	Klawock Pink	103	60	81	Little John Creek	Ketchikan	SSE
116	Klawock Pink	103	60	85	Sandy Cove Right	Ketchikan	SSE

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Appendix C.1.–Continued (page 7 of 22)

STOCK-CODE	STOCK	DISTRICT	SUB-DISTRICT	STREAM CODE	STREAM	AREA OFFICE	SUB-REGION
116	Klawock Pink	103	60	87	Deep Bay	Ketchikan	SSE
116	Klawock Pink	103	60	89	Perlas Point Creek	Ketchikan	SSE
116	Klawock Pink	103	60	90	East of Caldera	Ketchikan	SSE
116	Klawock Pink	103	60	92	Port Caldera	Ketchikan	SSE
116	Klawock Pink	103	60	93	West of Caldera	Ketchikan	SSE
116	Klawock Pink	103	70	5	James Creek	Ketchikan	SSE
116	Klawock Pink	103	70	8	Goodrow Creek	Ketchikan	SSE
116	Klawock Pink	103	70	11	11 Mile Creek	Ketchikan	SSE
130	Sea Otter Sound Pink	103	80	15	Warm Chuck In SW	Ketchikan	SSE
130	Sea Otter Sound Pink	103	80	24	Warm Chuck NW Side	Ketchikan	SSE
130	Sea Otter Sound Pink	103	80	26	Warm Chuck Left Head	Ketchikan	SSE
130	Sea Otter Sound Pink	103	80	31	Chuck Lake Creek	Ketchikan	SSE
116	Klawock Pink	103	80	35	Nossuk Bay Left Head	Ketchikan	SSE
116	Klawock Pink	103	80	42	Salt Lk Bay N Head	Ketchikan	SSE
116	Klawock Pink	103	80	44	Salt Lk Bay Head	Ketchikan	SSE
116	Klawock Pink	103	80	46	Salt Lk Bay R Head	Ketchikan	SSE
116	Klawock Pink	103	80	50	S of Salt Lake Bay	Ketchikan	SSE
116	Klawock Pink	103	80	56	Inside St Phillips S	Ketchikan	SSE
116	Klawock Pink	103	90	4	Sarheen Cove	Ketchikan	SSE
116	Klawock Pink	103	90	6	El Capitan East Side	Ketchikan	SSE
116	Klawock Pink	103	90	25	Yatuk Creek	Ketchikan	SSE
116	Klawock Pink	103	90	26	Naukati Creek	Ketchikan	SSE
116	Klawock Pink	103	90	27	Gutchie Creek	Ketchikan	SSE
116	Klawock Pink	103	90	28	Slow Creek	Ketchikan	SSE
116	Klawock Pink	103	90	30	Staney Creek	Ketchikan	SSE
116	Klawock Pink	103	90	42	Shaheen Creek	Ketchikan	SSE
130	Sea Otter Sound Pink	103	90	57	Edna Bay	Ketchikan	SSE
130	Sea Otter Sound Pink	103	90	58	Charley Creek	Ketchikan	SSE
130	Sea Otter Sound Pink	103	90	59	Edna Bay Head	Ketchikan	SSE
130	Sea Otter Sound Pink	103	90	61	Hamlin Creek	Ketchikan	SSE
130	Sea Otter Sound Pink	103	90	63	Van Sant Cove	Ketchikan	SSE
130	Sea Otter Sound Pink	103	90	64	Holbrook In W Side	Ketchikan	SSE
130	Sea Otter Sound Pink	103	90	65	Holbrook Inlet Head	Ketchikan	SSE
130	Sea Otter Sound Pink	103	90	67	Tokeen Bay N Side	Ketchikan	SSE

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Appendix C.1.–Continued (page 8 of 22)

STOCK-CODE	STOCK	DISTRICT	SUB-DISTRICT	STREAM CODE	STREAM	AREA OFFICE	SUB-REGION
130	Sea Otter Sound Pink	103	90	69	Tokeen Bay Head	Ketchikan	SSE
130	Sea Otter Sound Pink	103	90	73	Tokeen Bay Southeast	Ketchikan	SSE
130	Sea Otter Sound Pink	103	90	75	Tenass Passage	Ketchikan	SSE
130	Sea Otter Sound Pink	103	90	80	Devilfish Bay Head	Ketchikan	SSE
130	Sea Otter Sound Pink	103	90	81	Devilfish Bay N Side	Ketchikan	SSE
101	Affleck Canal Pink	105	10	3	2nd N Louise Cove	Petersburg	SSE
101	Affleck Canal Pink	105	10	9	West of Pt Amelius	Petersburg	SSE
101	Affleck Canal Pink	105	10	10	N of Louise Cove	Petersburg	SSE
101	Affleck Canal Pink	105	10	11	Louise Cove	Petersburg	SSE
101	Affleck Canal Pink	105	10	16	Linda Sue Slough	Petersburg	SSE
101	Affleck Canal Pink	105	10	17	East of Bear Harbor	Petersburg	SSE
101	Affleck Canal Pink	105	10	18	Affleck Canal NE	Petersburg	SSE
101	Affleck Canal Pink	105	10	19	Kathleen Creek	Petersburg	SSE
101	Affleck Canal Pink	105	10	21	Joan Ck Affleck Can	Petersburg	SSE
101	Affleck Canal Pink	105	10	24	Bear Harbor Creek	Petersburg	SSE
101	Affleck Canal Pink	105	10	26	Salt Chuck Affleck	Petersburg	SSE
101	Affleck Canal Pink	105	10	28	Kell Slough Creek	Petersburg	SSE
101	Affleck Canal Pink	105	10	32	Kell Bay Creek	Petersburg	SSE
101	Affleck Canal Pink	105	20	2	Kim Creek Beauclerc	Petersburg	SSE
101	Affleck Canal Pink	105	20	4	Paul Creek N Arm Hd	Petersburg	SSE
101	Affleck Canal Pink	105	20	5	P Beauclerc NW Head	Petersburg	SSE
101	Affleck Canal Pink	105	20	6	P Beauclerc Lk	Petersburg	SSE
101	Affleck Canal Pink	105	20	7	P Beauclerc NW Side	Petersburg	SSE
101	Affleck Canal Pink	105	20	8	Cannery Ck Beauclerc	Petersburg	SSE
101	Affleck Canal Pink	105	20	9	P Beauclerc S Arm Hd	Petersburg	SSE
101	Affleck Canal Pink	105	20	10	Gail Ck S Arm SE Hd	Petersburg	SSE
101	Affleck Canal Pink	105	20	12	P Beauclerc S Arm E	Petersburg	SSE
101	Affleck Canal Pink	105	31	3	Kushneahin Creek	Petersburg	SSE
101	Affleck Canal Pink	105	31	19	Alvin Bay North Side	Petersburg	SSE
101	Affleck Canal Pink	105	31	20	Alvin Bay Head	Petersburg	SSE
101	Affleck Canal Pink	105	31	25	Reid Bay N Arm E	Petersburg	SSE
101	Affleck Canal Pink	105	31	27	Reid Bay West Side	Petersburg	SSE
101	Affleck Canal Pink	105	31	29	Reid Bay SW Arm Hd	Petersburg	SSE
101	Affleck Canal Pink	105	32	1	Lovelace Creek	Petersburg	SSE

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Appendix C.1.–Continued (page 9 of 22)

STOCK-CODE	STOCK	DISTRICT	SUB-DISTRICT	STREAM CODE	STREAM	AREA OFFICE	SUB-REGION
101	Affleck Canal Pink	105	32	4	Tunehean Creek	Petersburg	SSE
101	Affleck Canal Pink	105	32	73	3 Mile Arm NW Arm Hd	Petersburg	SSE
101	Affleck Canal Pink	105	32	80	Seclusion Harbor N	Petersburg	SSE
101	Affleck Canal Pink	105	32	82	Seclusion Hbr Head	Petersburg	SSE
132	Shipley Bay Pink	105	41	5	Hole-In-The-Wall SE	Petersburg	SSE
132	Shipley Bay Pink	105	42	5	Calder Creek	Petersburg	SSE
132	Shipley Bay Pink	105	42	6	Marble Creek Shakan	Petersburg	SSE
132	Shipley Bay Pink	105	42	8	Bear Ck Dry Pass	Petersburg	SSE
132	Shipley Bay Pink	105	42	9	El Capitan Creek	Petersburg	SSE
132	Shipley Bay Pink	105	42	10	Wolf Ck N El Capitan	Petersburg	SSE
132	Shipley Bay Pink	105	42	11	El Capitan-Aneskett	Petersburg	SSE
132	Shipley Bay Pink	105	42	12	El Capitan Dry Pass	Petersburg	SSE
132	Shipley Bay Pink	105	43	2	Shipley Bay Lk Ck	Petersburg	SSE
132	Shipley Bay Pink	105	43	5	Shipley Bay SE Side	Petersburg	SSE
132	Shipley Bay Pink	105	43	6	Shipley Bay S Side	Petersburg	SSE
132	Shipley Bay Pink	105	50	1	Trout Ck Kosciusko I	Petersburg	SSE
125	Ratz Harbor Pink	106	10	4	Sal Creek	Petersburg	SSE
125	Ratz Harbor Pink	106	10	6	Little Ratz Creek	Petersburg	SSE
125	Ratz Harbor Pink	106	10	10	Ratz Hbr Creek	Petersburg	SSE
125	Ratz Harbor Pink	106	10	30	Eagle Ck Luck Lake	Petersburg	SSE
103	Burnett Pink	106	20	10	Streets Ck Rocky Bay	Petersburg	SSE
103	Burnett Pink	106	20	23	McHenry Anchorage Ck	Petersburg	SSE
103	Burnett Pink	106	21	3	Hatchery Lk E End	Petersburg	SSE
103	Burnett Pink	106	21	4	Falls Ck McHenry In	Petersburg	SSE
103	Burnett Pink	106	21	5	Trout Ck McHenry In	Petersburg	SSE
103	Burnett Pink	106	22	4	Mosman Inlet NW Head	Petersburg	SSE
103	Burnett Pink	106	22	6	Flat Ck Mosman Inlet	Petersburg	SSE
103	Burnett Pink	106	22	8	Mosman Creek E Head	Petersburg	SSE
103	Burnett Pink	106	22	10	Mosman In SE Head	Petersburg	SSE
103	Burnett Pink	106	22	16	Navy Cr	Petersburg	SSE
145	Whale Pass Pink	106	30	4	Quiet Harbor	Petersburg	SSE
145	Whale Pass Pink	106	30	10	Porcupine Ck Steamer	Petersburg	SSE
145	Whale Pass Pink	106	30	12	Chum Creek Coffman	Petersburg	SSE
145	Whale Pass Pink	106	30	15	Coffman Ck Coffman C	Petersburg	SSE

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Appendix C.1.–Continued (page 10 of 22)

STOCK-CODE	STOCK	DISTRICT	SUB-DISTRICT	STREAM CODE	STREAM	AREA OFFICE	SUB-REGION
145	Whale Pass Pink	106	30	51	Hatchery Ck Sweetwater	Petersburg	SSE
145	Whale Pass Pink	106	30	72	Mabel Ck Whale Pass	Petersburg	SSE
145	Whale Pass Pink	106	30	82	Squaw Ck Whale Pass	Petersburg	SSE
145	Whale Pass Pink	106	30	85	Exchange Cove Creek	Petersburg	SSE
145	Whale Pass Pink	106	35	77	Whale Passage W Head	Petersburg	SSE
145	Whale Pass Pink	106	35	80	108 Creek Whale Pass	Petersburg	SSE
139	Totem Bay Pink	106	41	10	Salmon Bay Creek	Petersburg	SSE
139	Totem Bay Pink	106	41	30	Red Lake Creek Sumner	Petersburg	SSE
139	Totem Bay Pink	106	41	34	Big Ck Red Bay	Petersburg	SSE
139	Totem Bay Pink	106	41	42	Buster Creek	Petersburg	SSE
139	Totem Bay Pink	106	41	44	Alder Creek	Petersburg	SSE
139	Totem Bay Pink	106	41	45	Flicker Creek	Petersburg	SSE
139	Totem Bay Pink	106	41	55	Totem Creek	Petersburg	SSE
139	Totem Bay Pink	106	41	58	Zim Ck Totem Bay	Petersburg	SSE
139	Totem Bay Pink	106	41	60	Totem Bay NE Side	Petersburg	SSE
139	Totem Bay Pink	106	41	65	Douglas Bay	Petersburg	SSE
139	Totem Bay Pink	106	42	3	St Johns Harbor	Petersburg	SSE
139	Totem Bay Pink	106	42	10	Kah Sheets Creek	Petersburg	SSE
139	Totem Bay Pink	106	44	60	Petersburg Creek	Petersburg	SSE
140	Union Bay Pink	107	10	10	Emerald Creek	Petersburg	SSE
140	Union Bay Pink	107	10	20	Vixen Inlet Creek	Petersburg	SSE
140	Union Bay Pink	107	10	24	Vixen Inlet West Sd	Petersburg	SSE
140	Union Bay Pink	107	10	25	Vixen Harbor	Petersburg	SSE
140	Union Bay Pink	107	10	30	Black Bear Creek	Petersburg	SSE
140	Union Bay Pink	107	10	70	Kudays Ck S Etolin	Petersburg	SSE
140	Union Bay Pink	107	10	71	Chum Ck S Etolin Mid	Petersburg	SSE
140	Union Bay Pink	107	10	72	S Etolin Island East	Petersburg	SSE
102	Anan Pink	107	20	1	Anan Creek	Petersburg	SSE
102	Anan Pink	107	20	10	Santa Anna Inlet	Petersburg	SSE
102	Anan Pink	107	20	15	June Creek	Petersburg	SSE
102	Anan Pink	107	20	16	Watkins Point Creek	Petersburg	SSE
102	Anan Pink	107	20	20	Canoe Pass Etolin Is	Petersburg	SSE
102	Anan Pink	107	20	23	Fisherman Chuck	Petersburg	SSE
102	Anan Pink	107	20	30	Menefee Creek	Petersburg	SSE

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Appendix C.1.–Continued (page 11 of 22)

STOCK-CODE	STOCK	DISTRICT	SUB-DISTRICT	STREAM CODE	STREAM	AREA OFFICE	SUB-REGION
102	Anan Pink	107	20	70	Fools Inlet Head W	Petersburg	SSE
102	Anan Pink	107	20	71	Fools Inlet Head E	Petersburg	SSE
102	Anan Pink	107	30	30	Thoms Creek	Petersburg	SSE
102	Anan Pink	107	30	70	Snake Ck Olive Cove	Petersburg	SSE
102	Anan Pink	107	30	78	Anita Bay Head W	Petersburg	SSE
102	Anan Pink	107	30	80	Brad Ck NW Anita Bay	Petersburg	SSE
102	Anan Pink	107	30	90	Dog Salmon NE Etolin	Petersburg	SSE
102	Anan Pink	107	40	22	Berg Creek	Petersburg	SSE
102	Anan Pink	107	40	25	Oerns Creek	Petersburg	SSE
102	Anan Pink	107	40	38	Marten Ck Bradfield	Petersburg	SSE
102	Anan Pink	107	40	40	Franks Ck Bradfield	Petersburg	SSE
102	Anan Pink	107	40	47	Tom Lake Creek	Petersburg	SSE
102	Anan Pink	107	40	49	Harding River	Petersburg	SSE
102	Anan Pink	107	40	53	Bradfield River E Fk	Petersburg	SSE
102	Anan Pink	107	40	55	Eagle R Bradfield	Petersburg	SSE
102	Anan Pink	107	40	57	1st E of Hoya Creek	Petersburg	SSE
102	Anan Pink	107	40	64	Bradfield Can SW E	Petersburg	SSE
102	Anan Pink	107	40	65	Bradfield Can SW W	Petersburg	SSE
102	Anan Pink	107	45	5	Crittenden Creek	Petersburg	SSE
102	Anan Pink	107	45	6	E of Crittenden Ck	Petersburg	SSE
136	Stikine Pink	108	20	1	King George Ck	Petersburg	SSE
136	Stikine Pink	108	40	20	Andrews Creek	Petersburg	SSE
136	Stikine Pink	108	40	13A	W of Hot Springs	Petersburg	SSE
136	Stikine Pink	108	41	10	North Arm Creek	Petersburg	SSE
136	Stikine Pink	108	50	3	Bear Ck Frederick Sd	Petersburg	SSE
136	Stikine Pink	108	60	6	Fivemile Ck Sukoi Is	Petersburg	SSE
126	SE Baranof Pink	109	10	6	Sashin Ck P Walter N	Sitka	NSE Inside
126	SE Baranof Pink	109	10	9	Lovers Cove Creek	Sitka	NSE Inside
126	SE Baranof Pink	109	10	23	Deep Cove NW Head	Sitka	NSE Inside
126	SE Baranof Pink	109	10	28	Patterson Bay Head	Sitka	NSE Inside
104	E Baranof Pink	109	20	7	Gut Bay Head	Sitka	NSE Inside
104	E Baranof Pink	109	20	16	Red Bluff Bay S Head	Sitka	NSE Inside
107	Eliza Harbor Pink	109	30	1	Woewodski Harbor	Petersburg	NSE Inside
107	Eliza Harbor Pink	109	30	3	Eliza Creek	Petersburg	NSE Inside

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Appendix C.1.–Continued (page 12 of 22)

STOCK-CODE	STOCK	DISTRICT	SUB-DISTRICT	STREAM CODE	STREAM	AREA OFFICE	SUB-REGION
107	Eliza Harbor Pink	109	30	4	Eliza Hbr Head West	Petersburg	NSE Inside
107	Eliza Harbor Pink	109	30	5	Eliza Hbr West Side	Petersburg	NSE Inside
107	Eliza Harbor Pink	109	30	6	Eliza Lake Creek	Petersburg	NSE Inside
107	Eliza Harbor Pink	109	30	8	Chapin Bay Head	Petersburg	NSE Inside
107	Eliza Harbor Pink	109	30	10	Herring Bay East	Petersburg	NSE Inside
107	Eliza Harbor Pink	109	30	11	Herring Bay Middle	Petersburg	NSE Inside
107	Eliza Harbor Pink	109	30	13	Bergmann Creek	Petersburg	NSE Inside
107	Eliza Harbor Pink	109	30	16	Tyee Head East	Petersburg	NSE Inside
107	Eliza Harbor Pink	109	30	17	Curtiss Creek	Petersburg	NSE Inside
107	Eliza Harbor Pink	109	30	18	Surprise Harbor East	Petersburg	NSE Inside
107	Eliza Harbor Pink	109	30	25	Little Pybus Bay Ck	Petersburg	NSE Inside
128	Saginaw Bay Pink	109	42	1	Point White Creek	Petersburg	NSE Inside
128	Saginaw Bay Pink	109	42	5	Jenny Ck	Petersburg	NSE Inside
128	Saginaw Bay Pink	109	42	9	Cathedral Falls Ck	Petersburg	NSE Inside
128	Saginaw Bay Pink	109	42	10	Hamilton River	Petersburg	NSE Inside
128	Saginaw Bay Pink	109	42	30	Kadake Creek	Petersburg	NSE Inside
128	Saginaw Bay Pink	109	44	35	Straight Ck Sag Bay	Petersburg	NSE Inside
128	Saginaw Bay Pink	109	44	37	Saginaw Bay S Head	Petersburg	NSE Inside
128	Saginaw Bay Pink	109	44	39	Saginaw Creek	Petersburg	NSE Inside
128	Saginaw Bay Pink	109	45	10	Security Bay Creek	Petersburg	NSE Inside
128	Saginaw Bay Pink	109	45	13	Salt Chuck-Security	Petersburg	NSE Inside
128	Saginaw Bay Pink	109	45	15	Security Bay S Side	Petersburg	NSE Inside
128	Saginaw Bay Pink	109	45	16	Security Bay S Mid	Petersburg	NSE Inside
128	Saginaw Bay Pink	109	45	17	Lookout Pt Ck Sec B	Petersburg	NSE Inside
128	Saginaw Bay Pink	109	51	5	Piledriver Cove NW Kuiu	Petersburg	NSE Inside
128	Saginaw Bay Pink	109	51	11	0.7M S Washington B	Petersburg	NSE Inside
137	Tebenkof Pink	109	52	1	East of Pt Sullivan	Petersburg	NSE Inside
137	Tebenkof Pink	109	52	2	Outer Rowan Bay	Petersburg	NSE Inside
137	Tebenkof Pink	109	52	4	Rowan Bay NW Side	Petersburg	NSE Inside
137	Tebenkof Pink	109	52	5	Wanigan Creek	Petersburg	NSE Inside
137	Tebenkof Pink	109	52	7	Rowan Creek	Petersburg	NSE Inside
137	Tebenkof Pink	109	52	8	Rowan Bay E Head	Petersburg	NSE Inside
137	Tebenkof Pink	109	52	9	Rowan Bay SE Head	Petersburg	NSE Inside
137	Tebenkof Pink	109	52	30	Pillar Bay Head	Petersburg	NSE Inside

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Appendix C.1.–Continued (page 13 of 22)

STOCK-CODE	STOCK	DISTRICT	SUB-DISTRICT	STREAM CODE	STREAM	AREA OFFICE	SUB-REGION
137	Tebenkof Pink	109	52	35	Kutlaku Creek	Petersburg	NSE Inside
137	Tebenkof Pink	109	52	50	Pillar Bay SW Side	Petersburg	NSE Inside
137	Tebenkof Pink	109	52	55	Kwatahein Ck Pillar	Petersburg	NSE Inside
137	Tebenkof Pink	109	62	3	Piledriver Cove Teb	Petersburg	NSE Inside
137	Tebenkof Pink	109	62	9	4th NE of Gap Pt	Petersburg	NSE Inside
137	Tebenkof Pink	109	62	10	Elena Bay NW Side	Petersburg	NSE Inside
137	Tebenkof Pink	109	62	11	Elena Bay NW Head	Petersburg	NSE Inside
137	Tebenkof Pink	109	62	12	Elena Bay Head	Petersburg	NSE Inside
137	Tebenkof Pink	109	62	13	Alecks Creek	Petersburg	NSE Inside
137	Tebenkof Pink	109	62	14	Sample Creek	Petersburg	NSE Inside
137	Tebenkof Pink	109	62	15	Slough Creek	Petersburg	NSE Inside
137	Tebenkof Pink	109	62	17	W of Long Island	Petersburg	NSE Inside
137	Tebenkof Pink	109	62	18	Goose Trap Ck	Petersburg	NSE Inside
137	Tebenkof Pink	109	62	20	Petrof Bay SE Head	Petersburg	NSE Inside
137	Tebenkof Pink	109	62	22	Petrof Bay S Head	Petersburg	NSE Inside
137	Tebenkof Pink	109	62	24	Petrof Bay W Head	Petersburg	NSE Inside
137	Tebenkof Pink	109	62	26	Petrof Bay SW Head	Petersburg	NSE Inside
137	Tebenkof Pink	109	62	28	William Ck Thetis E	Petersburg	NSE Inside
137	Tebenkof Pink	109	62	29	Wolf Ck Thetis Bay	Petersburg	NSE Inside
137	Tebenkof Pink	109	62	30	Thetis Bay SW Head	Petersburg	NSE Inside
137	Tebenkof Pink	109	62	31	Thetis B Salt Chuck	Petersburg	NSE Inside
137	Tebenkof Pink	109	62	36	Neal Creek	Petersburg	NSE Inside
137	Tebenkof Pink	109	62	38	Gedney Hbr S Head	Petersburg	NSE Inside
137	Tebenkof Pink	109	62	13A	1st S Alecks Creek	Petersburg	NSE Inside
137	Tebenkof Pink	109	63	1	Gods Pocket West	Petersburg	NSE Inside
137	Tebenkof Pink	109	63	2	Gods Pocket North	Petersburg	NSE Inside
137	Tebenkof Pink	109	63	3	2nd W Joyce Creek	Petersburg	NSE Inside
137	Tebenkof Pink	109	63	5	Joyce Ck Malmesbury	Petersburg	NSE Inside
137	Tebenkof Pink	109	63	12	P Malmesbury Lake Ck	Petersburg	NSE Inside
137	Tebenkof Pink	109	63	15	P Malmesbury S Arm E	Petersburg	NSE Inside
137	Tebenkof Pink	109	63	17	P Malmesbury S Arm S	Petersburg	NSE Inside
137	Tebenkof Pink	109	63	02C	Tavin Creek	Petersburg	NSE Inside
121	Portage Bay Pink	110	11	3	Twelvemile Ck Fred S	Petersburg	NSE Inside
121	Portage Bay Pink	110	13	4	Dry Bay Creek	Petersburg	NSE Inside

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Appendix C.1.–Continued (page 14 of 22)

STOCK-CODE	STOCK	DISTRICT	SUB-DISTRICT	STREAM CODE	STREAM	AREA OFFICE	SUB-REGION
108	Farragut Bay Pink	110	14	5	Farragut Bay N Arm	Petersburg	NSE Inside
108	Farragut Bay Pink	110	14	7	Farragut River	Petersburg	NSE Inside
108	Farragut Bay Pink	110	14	8	Dale Ck Francis Anch	Petersburg	NSE Inside
108	Farragut Bay Pink	110	15	3	Cat Creek Pt. Highland	Petersburg	NSE Inside
121	Portage Bay Pink	110	16	2	Portage Bay Head	Petersburg	NSE Inside
121	Portage Bay Pink	110	16	7	2nd W of West Point	Petersburg	NSE Inside
121	Portage Bay Pink	110	16	13	1st E Schooner Is	Petersburg	NSE Inside
121	Portage Bay Pink	110	16	14	Schooner Island	Petersburg	NSE Inside
121	Portage Bay Pink	110	17	5	SW of Pinta Rocks	Petersburg	NSE Inside
124	Pybus/Gambier Pink	110	21	4	False Pt Pybus Creek	Petersburg	NSE Inside
124	Pybus/Gambier Pink	110	21	5	N of Square Point	Petersburg	NSE Inside
124	Pybus/Gambier Pink	110	22	2	Old Mans Ck Pybus B	Petersburg	NSE Inside
124	Pybus/Gambier Pink	110	22	4	Amber Ck N Arm Pybus	Petersburg	NSE Inside
124	Pybus/Gambier Pink	110	22	6	Pybus Bay Head	Petersburg	NSE Inside
124	Pybus/Gambier Pink	110	22	8	Pybus Bay Main Arm	Petersburg	NSE Inside
124	Pybus/Gambier Pink	110	22	9	Beautiful Creek	Petersburg	NSE Inside
124	Pybus/Gambier Pink	110	22	12	Donkey Creek	Petersburg	NSE Inside
124	Pybus/Gambier Pink	110	22	14	Cannery Cove Pybus B	Petersburg	NSE Inside
124	Pybus/Gambier Pink	110	23	4	Last Chance Ck Gam B	Petersburg	NSE Inside
124	Pybus/Gambier Pink	110	23	5	Gambier B N Arm West	Petersburg	NSE Inside
124	Pybus/Gambier Pink	110	23	6	Marker Creek	Petersburg	NSE Inside
124	Pybus/Gambier Pink	110	23	7	West of Marker Creek	Petersburg	NSE Inside
124	Pybus/Gambier Pink	110	23	8	Johnston Creek	Petersburg	NSE Inside
124	Pybus/Gambier Pink	110	23	10	Bowman Creek	Petersburg	NSE Inside
124	Pybus/Gambier Pink	110	23	12	1st East of Bowman	Petersburg	NSE Inside
124	Pybus/Gambier Pink	110	23	19	Snug Cove Gambier B	Petersburg	NSE Inside
124	Pybus/Gambier Pink	110	23	40	East of Snug Cove	Petersburg	NSE Inside
113	Houghton Pink	110	31	1	Rockpile Ck Stephens	Petersburg	NSE Inside
113	Houghton Pink	110	31	4	Roberts Island Ck	Petersburg	NSE Inside
113	Houghton Pink	110	32	2	Goat Ck Windham Bay	Petersburg	NSE Inside
113	Houghton Pink	110	32	7	Tunnel Ck Windham	Petersburg	NSE Inside
113	Houghton Pink	110	32	9	Chuck R Windham Bay	Petersburg	NSE Inside
113	Houghton Pink	110	32	14	Surprise Ck Windham	Petersburg	NSE Inside
113	Houghton Pink	110	33	6	Herman Klaus Creek	Petersburg	NSE Inside

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Appendix C.1.–Continued (page 15 of 22)

STOCK-CODE	STOCK	DISTRICT	SUB-DISTRICT	STREAM CODE	STREAM	AREA OFFICE	SUB-REGION
113	Houghton Pink	110	33	8	Nancy Ck Hobart Bay	Petersburg	NSE Inside
113	Houghton Pink	110	33	13	Lauras Creek	Petersburg	NSE Inside
113	Houghton Pink	110	34	1	P Houghton N Side	Petersburg	NSE Inside
113	Houghton Pink	110	34	2	West of Bluffs	Petersburg	NSE Inside
113	Houghton Pink	110	34	3	Rusty River	Petersburg	NSE Inside
113	Houghton Pink	110	34	6	Glen Creek	Petersburg	NSE Inside
113	Houghton Pink	110	34	8	Sanborn Creek	Petersburg	NSE Inside
113	Houghton Pink	110	34	12	Placer Ck P Houghton	Petersburg	NSE Inside
113	Houghton Pink	110	34	13	1st E of Negro Creek	Petersburg	NSE Inside
113	Houghton Pink	110	34	14	Negro Creek	Petersburg	NSE Inside
113	Houghton Pink	110	34	01A	Harmony Creek	Petersburg	NSE Inside
131	Seymour Canal Pink	111	11	20	Bear Ck Seymour Can	Juneau	NSE Inside
131	Seymour Canal Pink	111	12	5	Pleasant Bay Creek	Juneau	NSE Inside
131	Seymour Canal Pink	111	13	10	Mole River	Juneau	NSE Inside
131	Seymour Canal Pink	111	13	15	Mole Harbor N Side	Juneau	NSE Inside
131	Seymour Canal Pink	111	14	38	Opposite S Tiedeman	Juneau	NSE Inside
131	Seymour Canal Pink	111	14	42	Opp Middle Tiedeman	Juneau	NSE Inside
131	Seymour Canal Pink	111	14	44	W Side Seymour Canal	Juneau	NSE Inside
131	Seymour Canal Pink	111	15	20	Windfall Creek	Juneau	NSE Inside
131	Seymour Canal Pink	111	15	22	Windfall Hbr S Head	Juneau	NSE Inside
131	Seymour Canal Pink	111	15	24	Windfall Hbr W Side	Juneau	NSE Inside
131	Seymour Canal Pink	111	15	30	Pack Creek	Juneau	NSE Inside
131	Seymour Canal Pink	111	16	35	Swan Cove South Ck	Juneau	NSE Inside
131	Seymour Canal Pink	111	16	40	Swan Cove Creek	Juneau	NSE Inside
131	Seymour Canal Pink	111	17	10	King Salmon River	Juneau	NSE Inside
135	Stephens Pink	111	20	20	Thistle Ledge Creek	Juneau	NSE Inside
135	Stephens Pink	111	20	24	Point League Creek	Juneau	NSE Inside
135	Stephens Pink	111	20	31	S of Midway Point	Juneau	NSE Inside
135	Stephens Pink	111	20	38	S of Pt. Glass Penn	Juneau	NSE Inside
135	Stephens Pink	111	20	40	N of Pt. Glass Penn	Juneau	NSE Inside
135	Stephens Pink	111	21	46	Indian Ck Round Is	Juneau	NSE Inside
135	Stephens Pink	111	21	52	N of Bushy Island	Juneau	NSE Inside
135	Stephens Pink	111	21	53	NE of Bushy Island	Juneau	NSE Inside
135	Stephens Pink	111	21	95	Sanford Cove S Head	Juneau	NSE Inside

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Appendix C.1.–Continued (page 16 of 22)

STOCK-CODE	STOCK	DISTRICT	SUB-DISTRICT	STREAM CODE	STREAM	AREA OFFICE	SUB-REGION
135	Stephens Pink	111	31	30	3rd S of Twin Point	Juneau	NSE Inside
135	Stephens Pink	111	31	36	1st S of Twin Point	Juneau	NSE Inside
135	Stephens Pink	111	31	40	Twin Point Creek	Juneau	NSE Inside
135	Stephens Pink	111	32	80	Turner Lake Outlet	Juneau	NSE Inside
135	Stephens Pink	111	32	99	Slocum Creek	Juneau	NSE Inside
135	Stephens Pink	111	33	10	Prospect Ck Speel	Juneau	NSE Inside
135	Stephens Pink	111	35	20	Sweetheart Creek	Juneau	NSE Inside
135	Stephens Pink	111	35	32	Gilbert Creek	Juneau	NSE Inside
135	Stephens Pink	111	40	15	Salmon Creek Gast Ch	Juneau	NSE Inside
135	Stephens Pink	111	40	28	Sheep Creek	Juneau	NSE Inside
135	Stephens Pink	111	40	65	Middle Point Creek	Juneau	NSE Inside
135	Stephens Pink	111	40	70	Hilda Ck Douglas Is	Juneau	NSE Inside
135	Stephens Pink	111	41	5	Admiralty Creek	Juneau	NSE Inside
135	Stephens Pink	111	41	12	1st W Admiralty Ck	Juneau	NSE Inside
135	Stephens Pink	111	41	16	West Cabin Creek	Juneau	NSE Inside
135	Stephens Pink	111	41	17	Cabin Creek	Juneau	NSE Inside
135	Stephens Pink	111	41	18	Fowler Ck Young Bay	Juneau	NSE Inside
135	Stephens Pink	111	50	10	Peterson Ck Favor C	Juneau	NSE Inside
135	Stephens Pink	111	50	37	Wadleigh Creek	Juneau	NSE Inside
135	Stephens Pink	111	50	42	Auke Creek	Juneau	NSE Inside
135	Stephens Pink	111	50	75	Peterson Ck Doug Is	Juneau	NSE Inside
135	Stephens Pink	111	50	80	Bear Ck Stephens Pas	Juneau	NSE Inside
135	Stephens Pink	111	50	88	Barlow Cove Head	Juneau	NSE Inside
135	Stephens Pink	111	50	90	West Hd Barlow Cove	Juneau	NSE Inside
135	Stephens Pink	111	50	92	Barlow Cove W Shore	Juneau	NSE Inside
135	Stephens Pink	111	90	5	Limestone Inlet	Juneau	NSE Inside
109	Freshwater Bay Pink	112	12	5	White Rock Creek	Juneau	NSE Inside
109	Freshwater Bay Pink	112	12	8	N of White Rock	Juneau	NSE Inside
109	Freshwater Bay Pink	112	12	16	Little Basket Bay	Juneau	NSE Inside
109	Freshwater Bay Pink	112	12	25	Kook Lake Outlet	Juneau	NSE Inside
109	Freshwater Bay Pink	112	12	34	N of Basket Bay	Juneau	NSE Inside
109	Freshwater Bay Pink	112	12	46	Gypsum Creek	Juneau	NSE Inside
109	Freshwater Bay Pink	112	12	50	Wukuklook Creek	Juneau	NSE Inside
109	Freshwater Bay Pink	112	13	6	Iyouktug Creek	Juneau	NSE Inside

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STOCK-CODE	STOCK	DISTRICT	SUB-DISTRICT	STREAM CODE	STREAM	AREA OFFICE	SUB-REGION
153	Lower Lynn Canal Pink	112	15	44	South Sisters Creek	Juneau	NSE Inside
153	Lower Lynn Canal Pink	112	15	54	Willie's Creek	Juneau	NSE Inside
153	Lower Lynn Canal Pink	112	15	62	Robinson Creek	Juneau	NSE Inside
141	W Admiralty Pink	112	16	30	Wheeler Creek	Juneau	NSE Inside
141	W Admiralty Pink	112	17	12	Lake Kathleen Creek	Juneau	NSE Inside
141	W Admiralty Pink	112	17	16	Ward Creek	Juneau	NSE Inside
141	W Admiralty Pink	112	17	25	Lake Florence Creek	Juneau	NSE Inside
141	W Admiralty Pink	112	17	30	Fishery Creek	Juneau	NSE Inside
141	W Admiralty Pink	112	17	40	Marble Creek	Juneau	NSE Inside
141	W Admiralty Pink	112	17	50	Thayer Creek	Juneau	NSE Inside
127	SW Admiralty Pink	112	19	10	Wilson River	Juneau	NSE Inside
127	SW Admiralty Pink	112	19	15	Wilson Cove SE	Juneau	NSE Inside
115	Kelp Bay Pink	112	21	5	Clear River Kelp Bay	Sitka	NSE Inside
115	Kelp Bay Pink	112	21	6	Ralphs Creek-Kelp B	Sitka	NSE Inside
115	Kelp Bay Pink	112	21	8	Kelp Bay M Arm Head	Sitka	NSE Inside
115	Kelp Bay Pink	112	21	9	Kelp Bay Portage Arm	Sitka	NSE Inside
138	Tenakee Pink	112	41	1	Passage Point Creek	Juneau	NSE Inside
138	Tenakee Pink	112	41	10	Trap Bay East	Juneau	NSE Inside
138	Tenakee Pink	112	42	8	Indian River-Tenakee	Juneau	NSE Inside
138	Tenakee Pink	112	42	16	Corner Bay Creek	Juneau	NSE Inside
138	Tenakee Pink	112	42	25	Kadashan Creek	Juneau	NSE Inside
138	Tenakee Pink	112	42	32	Rudy Creek	Juneau	NSE Inside
138	Tenakee Pink	112	43	2	Crab Bay South Side	Juneau	NSE Inside
138	Tenakee Pink	112	43	9	Crab Bay South Head	Juneau	NSE Inside
138	Tenakee Pink	112	43	12	Crab Bay Head	Juneau	NSE Inside
138	Tenakee Pink	112	44	10	Saltery Bay Head	Juneau	NSE Inside
138	Tenakee Pink	112	45	32	Eaton Creek	Juneau	NSE Inside
138	Tenakee Pink	112	45	36	E of Seal Bay Ent	Juneau	NSE Inside
138	Tenakee Pink	112	46	4	E Side Seal Bay	Juneau	NSE Inside
138	Tenakee Pink	112	46	9	Seal Bay Head	Juneau	NSE Inside
138	Tenakee Pink	112	47	10	Long Bay Head	Juneau	NSE Inside
138	Tenakee Pink	112	48	15	Big Goose Creek	Juneau	NSE Inside
138	Tenakee Pink	112	48	19	Little Goose Creek	Juneau	NSE Inside
138	Tenakee Pink	112	48	23	West Bay Head Creek	Juneau	NSE Inside

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Appendix C.1.–Continued (page 18 of 22)

STOCK-CODE	STOCK	DISTRICT	SUB-DISTRICT	STREAM CODE	STREAM	AREA OFFICE	SUB-REGION
138	Tenakee Pink	112	48	35	Tenakee Inlet Head	Juneau	NSE Inside
109	Freshwater Bay Pink	112	50	5	Wachusett Creek	Juneau	NSE Inside
109	Freshwater Bay Pink	112	50	10	Pavlof River	Juneau	NSE Inside
109	Freshwater Bay Pink	112	50	20	Kennel Creek	Juneau	NSE Inside
109	Freshwater Bay Pink	112	50	30	Freshwater Creek	Juneau	NSE Inside
109	Freshwater Bay Pink	112	50	32	Bay Head Creek	Juneau	NSE Inside
109	Freshwater Bay Pink	112	50	34	Freshwater Bay NE Hd	Juneau	NSE Inside
109	Freshwater Bay Pink	112	50	38	Seal Ck Freshwater B	Juneau	NSE Inside
153	Lower Lynn Canal Pink	112	61	6	Howard Bay West Side	Juneau	NSE Inside
153	Lower Lynn Canal Pink	112	61	8	Howard Bay NW Side	Juneau	NSE Inside
153	Lower Lynn Canal Pink	112	61	10	Point Howard Creek	Juneau	NSE Inside
141	W Admiralty Pink	112	63	12	Funter Bay S Side	Juneau	NSE Inside
141	W Admiralty Pink	112	63	13	Funter Creek	Juneau	NSE Inside
141	W Admiralty Pink	112	65	12	Jimmy Green Creek	Juneau	NSE Inside
141	W Admiralty Pink	112	65	14	Hawk Inlet Head NW	Juneau	NSE Inside
141	W Admiralty Pink	112	65	15	Hawk Inlet Head	Juneau	NSE Inside
141	W Admiralty Pink	112	65	24	Greens Creek	Juneau	NSE Inside
141	W Admiralty Pink	112	65	28	Piledriver Cove Crk	Juneau	NSE Inside
127	SW Admiralty Pink	112	67	35	Hasselborg River	Juneau	NSE Inside
127	SW Admiralty Pink	112	67	40	Jims Creek	Juneau	NSE Inside
127	SW Admiralty Pink	112	67	60	Kanalku Lake Creek	Juneau	NSE Inside
127	SW Admiralty Pink	112	67	80	Favorite Creek	Juneau	NSE Inside
127	SW Admiralty Pink	112	71	24	Narrows Creek	Juneau	NSE Inside
127	SW Admiralty Pink	112	72	11	Weir Ck N Arm Hood B	Juneau	NSE Inside
127	SW Admiralty Pink	112	72	12	Hood Bay N Arm E Hd	Juneau	NSE Inside
127	SW Admiralty Pink	112	73	15	Hood Bay S Arm N Sd	Juneau	NSE Inside
127	SW Admiralty Pink	112	73	17	Hood Bay s Arm Hd N	Juneau	NSE Inside
127	SW Admiralty Pink	112	73	20	Hood Bay S Arm Head	Juneau	NSE Inside
127	SW Admiralty Pink	112	73	24	Weir Ck S Arm Hood B	Juneau	NSE Inside
127	SW Admiralty Pink	112	73	30	1st NW of Weir Creek	Juneau	NSE Inside
127	SW Admiralty Pink	112	80	28	Chaik Bay Creek	Juneau	NSE Inside
127	SW Admiralty Pink	112	90	14	Whitewater Creek	Juneau	NSE Inside
127	SW Admiralty Pink	112	90	16	Whitewater S Arm Hd	Juneau	NSE Inside
144	Whale Bay Pink	113	22	6	Whale Bay Sm Arm NW	Sitka	NSE Outside

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Appendix C.1.–Continued (page 19 of 22)

STOCK-CODE	STOCK	DISTRICT	SUB-DISTRICT	STREAM CODE	STREAM	AREA OFFICE	SUB-REGION
144	Whale Bay Pink	113	22	8	Politofski Lk Outlet	Sitka	NSE Outside
144	Whale Bay Pink	113	22	15	Whale Bay Grt Arm Hd	Sitka	NSE Outside
144	Whale Bay Pink	113	22	18	Whale Bay Grt Arm E	Sitka	NSE Outside
143	W Crawfish Pink	113	32	4	W Crawfish N Arm NE	Sitka	NSE Outside
143	W Crawfish Pink	113	32	5	W Crawfish NE Arm Hd	Sitka	NSE Outside
133	Sitka Sound Pink	113	40	15	Starrigavin Creek	Sitka	NSE Outside
133	Sitka Sound Pink	113	40	17	Granite Creek	Sitka	NSE Outside
133	Sitka Sound Pink	113	41	32	Salmon Lake Stream	Sitka	NSE Outside
133	Sitka Sound Pink	113	41	34	Camp Coogan	Sitka	NSE Outside
133	Sitka Sound Pink	113	41	42	Kizhuchia Ck Red Bay	Sitka	NSE Outside
133	Sitka Sound Pink	113	41	13B	Eagle River	Sitka	NSE Outside
133	Sitka Sound Pink	113	42	2	Limit Ck Nakwasina P	Sitka	NSE Outside
133	Sitka Sound Pink	113	42	3	Noxen Creek	Sitka	NSE Outside
133	Sitka Sound Pink	113	43	2	Nakwasina River	Sitka	NSE Outside
133	Sitka Sound Pink	113	43	5	Liza Ck NakwasinaSnd	Sitka	NSE Outside
133	Sitka Sound Pink	113	44	3	Katlian River	Sitka	NSE Outside
133	Sitka Sound Pink	113	44	5	Katlian Bay S. Fork	Sitka	NSE Outside
112	Hoonah Sound Pink	113	51	1	Broad Creek	Sitka	NSE Inside
112	Hoonah Sound Pink	113	51	2	Oly Creek	Sitka	NSE Inside
112	Hoonah Sound Pink	113	51	4	False Island Creek	Sitka	NSE Inside
112	Hoonah Sound Pink	113	52	4	Hanus Bay	Sitka	NSE Inside
112	Hoonah Sound Pink	113	53	3	Saook Bay West Head	Sitka	NSE Inside
112	Hoonah Sound Pink	113	54	5	Appleton Cove W Head	Sitka	NSE Inside
112	Hoonah Sound Pink	113	54	7	Rodman Creek	Sitka	NSE Inside
112	Hoonah Sound Pink	113	55	1	Finger River	Sitka	NSE Inside
112	Hoonah Sound Pink	113	55	5	West Broad Creek	Sitka	NSE Inside
112	Hoonah Sound Pink	113	56	2	Ushk Bay SW End	Sitka	NSE Inside
112	Hoonah Sound Pink	113	56	3	Ushk Bay W End	Sitka	NSE Inside
112	Hoonah Sound Pink	113	57	1	Fick Cove Head	Sitka	NSE Inside
112	Hoonah Sound Pink	113	57	2	Hoonah Snd S Arm SW	Sitka	NSE Inside
112	Hoonah Sound Pink	113	57	5	Patterson Bay W Head	Sitka	NSE Inside
112	Hoonah Sound Pink	113	57	9	Hoonah Snd S Arm Hd	Sitka	NSE Inside
112	Hoonah Sound Pink	113	58	2	Hoonah Snd N Arm Wst	Sitka	NSE Inside

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Appendix C.1.–Continued (page 20 of 22)

STOCK-CODE	STOCK	DISTRICT	SUB-DISTRICT	STREAM CODE	STREAM	AREA OFFICE	SUB-REGION
112	Hoonah Sound Pink	113	58	3	Granite Creek N Arm	Sitka	NSE Inside
112	Hoonah Sound Pink	113	58	4	Hoonah Sound N Head	Sitka	NSE Inside
112	Hoonah Sound Pink	113	59	4	Sitkoh Lake Creek	Sitka	NSE Inside
112	Hoonah Sound Pink	113	59	7	Sitkoh Bay Head	Sitka	NSE Inside
129	Salisbury Sound Pink	113	62	6	Sukoi Inlet W Side	Sitka	NSE Outside
129	Salisbury Sound Pink	113	62	8	Sinitsin Cove Head	Sitka	NSE Outside
129	Salisbury Sound Pink	113	62	12	Sukoi Inlet SE Head	Sitka	NSE Outside
129	Salisbury Sound Pink	113	64	1	Deep Bay Head	Sitka	NSE Outside
129	Salisbury Sound Pink	113	65	4	Fish Bay Creek	Sitka	NSE Outside
129	Salisbury Sound Pink	113	65	5	Fish Bay S Side Head	Sitka	NSE Outside
129	Salisbury Sound Pink	113	66	3	Marine Cove	Sitka	NSE Outside
129	Salisbury Sound Pink	113	66	6	St. John Baptist Hd	Sitka	NSE Outside
134	Slocum Arm Pink	113	72	4	Rust Crk Sister Lake	Sitka	NSE Outside
134	Slocum Arm Pink	113	72	5	Sister Lake SE Head	Sitka	NSE Outside
134	Slocum Arm Pink	113	73	3	Lake Stream Ford Arm	Sitka	NSE Outside
134	Slocum Arm Pink	113	73	4	South Ford Arm	Sitka	NSE Outside
134	Slocum Arm Pink	113	73	6	Waterfall Cove Creek	Sitka	NSE Outside
134	Slocum Arm Pink	113	73	10	Slocum Arm Head	Sitka	NSE Outside
134	Slocum Arm Pink	113	73	12	Khaz Creek	Sitka	NSE Outside
123	Portlock Pink	113	81	3	Goulding Harbor Head	Sitka	NSE Outside
123	Portlock Pink	113	81	10	Black Bay North Head	Sitka	NSE Outside
123	Portlock Pink	113	81	11	Black River	Sitka	NSE Outside
117	Lisianski Pink	113	95	3	Pelican Creek	Sitka	NSE Outside
117	Lisianski Pink	113	95	4	Phonograph Ck Lis In	Sitka	NSE Outside
117	Lisianski Pink	113	95	6	Lisianski River	Sitka	NSE Outside
117	Lisianski Pink	113	95	7	Steelhead R SW Lis I	Sitka	NSE Outside
117	Lisianski Pink	113	96	2	Saltery Rvr Stag Bay	Sitka	NSE Outside
111	Homeshore Pink	114	23	22	Kahtaheena River	Juneau	NSE Inside
111	Homeshore Pink	114	23	24	East of Kahtaheena	Juneau	NSE Inside
120	N Chichagof Pink	114	23	35	Chicken Ck Icy Strts	Juneau	NSE Inside
120	N Chichagof Pink	114	23	70	Mud Bay River	Juneau	NSE Inside
120	N Chichagof Pink	114	23	73	West Mud Bay Head	Juneau	NSE Inside
120	N Chichagof Pink	114	23	80	Goose Creek	Juneau	NSE Inside

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Appendix C.1.–Continued (page 21 of 22)

STOCK-CODE	STOCK	DISTRICT	SUB-DISTRICT	STREAM CODE	STREAM	AREA OFFICE	SUB-REGION
111	Homeshore Pink	114	25	5	Windy Creek	Juneau	NSE Inside
111	Homeshore Pink	114	25	10	Homeshore Creek	Juneau	NSE Inside
111	Homeshore Pink	114	25	12	East Homeshore Creek	Juneau	NSE Inside
111	Homeshore Pink	114	25	18	Humpy Creek	Juneau	NSE Inside
111	Homeshore Pink	114	25	35	West Swamson Creek	Juneau	NSE Inside
120	N Chichagof Pink	114	27	12	Whitestone East Side	Juneau	NSE Inside
120	N Chichagof Pink	114	27	15	Suntaheen Creek	Juneau	NSE Inside
120	N Chichagof Pink	114	27	18	Whitestone Head	Juneau	NSE Inside
120	N Chichagof Pink	114	27	30	Spasski Creek	Juneau	NSE Inside
120	N Chichagof Pink	114	31	13	Game Creek	Juneau	NSE Inside
120	N Chichagof Pink	114	32	4	Seagull Creek	Juneau	NSE Inside
120	N Chichagof Pink	114	32	6	Bear Ck Midway Rocks	Juneau	NSE Inside
120	N Chichagof Pink	114	33	23	Neka River	Juneau	NSE Inside
120	N Chichagof Pink	114	34	10	Humpback Creek	Juneau	NSE Inside
120	N Chichagof Pink	114	40	19	Idaho Sandspit	Juneau	NSE Inside
120	N Chichagof Pink	114	40	23	Nip and Tuck Creek	Juneau	NSE Inside
120	N Chichagof Pink	114	40	25	Cabin Ck Idaho Inlet	Juneau	NSE Inside
120	N Chichagof Pink	114	40	35	Trail River	Juneau	NSE Inside
120	N Chichagof Pink	114	40	38	Marble Creek	Juneau	NSE Inside
120	N Chichagof Pink	114	50	10	Anchor Bite Creek	Juneau	NSE Inside
120	N Chichagof Pink	114	50	12	S Anchor Bite Creek	Juneau	NSE Inside
120	N Chichagof Pink	114	50	20	Althorp Creek	Juneau	NSE Inside
120	N Chichagof Pink	114	50	25	Humpie Ck Prt Althrp	Juneau	NSE Inside
120	N Chichagof Pink	114	50	30	Margret Ck P Althorp	Juneau	NSE Inside
111	Homeshore Pink	114	80	20	Excursion River	Juneau	NSE Inside
111	Homeshore Pink	114	80	45	Neva Creek	Juneau	NSE Inside
111	Homeshore Pink	114	80	50	Cabin Ck Excur Inlet	Juneau	NSE Inside
118	Upper Lynn Canal Pink	115	10	32	S of St. James Point	Juneau	NSE Inside

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Appendix C.1.–Continued (page 22 of 22)

STOCK-CODE	STOCK	DISTRICT	SUB-DISTRICT	STREAM CODE	STREAM	AREA OFFICE	SUB-REGION
118	Upper Lynn Canal Pink	115	10	42	St James Bay NW Side	Juneau	NSE Inside
118	Upper Lynn Canal Pink	115	10	46	St. James River	Juneau	NSE Inside
118	Upper Lynn Canal Pink	115	10	65	Beardslee River	Juneau	NSE Inside
118	Upper Lynn Canal Pink	115	10	68	W Head N Wm Henry B	Juneau	NSE Inside
118	Upper Lynn Canal Pink	115	10	80	Endicott River	Juneau	NSE Inside
118	Upper Lynn Canal Pink	115	20	52	Sawmill Ck Berners B	Juneau	NSE Inside
118	Upper Lynn Canal Pink	115	20	62	Cowee Ck Berners Bay	Juneau	NSE Inside
118	Upper Lynn Canal Pink	115	31	38	Sullivan Creek	Juneau	NSE Inside